Fortunati, L., & Vincent, J. (2014). Sociological insights on the comparison of writing/reading on paper with writing/reading digitally. *Telematics and Informatics*, 31(1), 39–51.

## Abstract

The aim of this article is to investigate the impact of digital technologies on writing and reading within an educational rather than business environment. It explores the affordances of writing and reading on paper and those of writing on a keyboard and reading on a screen. The analysis is based on an exploratory study carried out with a class of Masters Students in Multimedia Communication and Technologies of Information at the University of Udine (Italy) who were asked to write an essay on this topic. The methodology applied in this study is qualitative content analysis of the essays produced by the students. The principal results of this study show that reading and writing competencies are changing with the use of digital technologies but that paper and digital interactions are not mutually exclusive. Students are more productive textually with writing than with reading, however, they still see the virtues of writing on paper which they continue to use extensively. It appears that chirographic writing and paper is more multi-sensorial and meta-communicative than using the keyboard or screen. Further research is recommended to explore this complementarities of writing on paper and on screen/keyboard as well as the perceived changes in preferred sources of reading material.

## Introduction

Using personal computers began to be more prevalent in the 1980s and since that decade a certain amount of research has been published on the impact of this new digital technology on reading/writing.

This early research identified the changes in approach to reading in particular that were necessitated by the lack of haptic qualities of a book and the ergonomic differences between human interaction with a computer and keyboard and with paper and pen (Gould and Grischowsky, 1984; Suchman, 1987; Gaver, 1991; Dillon, 1992; O'Hara and Sellen, 1997).

In our present study we aim to explore beyond this physical human interaction between humans and computers towards the perception of the specific affordances of paper and digital tools in reading/writing. We begin by examining some of the extant literature on the topic and in particular an important study which compared the affordances of writing on paper and through digital technologies carried out by Abigail Sellen and Richard Harper (2002).

As the introduction of personal computers, and then mobile phones, gathered apace they analyzed the work activities in office settings for which paper and digital technologies were particularly well suited. They discovered that the life cycle of a document includes a close intertwining of paper and digital versions: digital for searching, paper for integrating multiple sources; paper for planning, digital for drafting; paper for editing/proof reading, digital for finalizing; mostly digital for distribution and workflow; paper for reading (especially longer documents) and digital for archiving/filing. While their study remains a seminal work it must be noted that it was conducted over 10 years ago,and in offices, since when there has been a huge change in the types of digital devices as well as in the locations where they can be used.

The development of e-reading devices highlights this well, exemplified by further research by Sellen and others (Hillesund, 2010; Mangen, 2008; Chen et al., forthcoming) that we explore later in this article. Another more recent approach to studying paper and digital technologies is that of Robert Waller (2012) who reflects on the different organization of the spatial setting of words and images between paper and screen. Waller asserts that the presentation of material online requires an understanding of graphic literacy that is generally lacking in most users; indeed, the know how required for interpreting online layout is more the prerogative of publishers (Duffy and Waller, 1985; Baron, 2008), making effective reading less straightforward.

Other studies on writing done in workplaces during the last decade were less focused on the contrast between paper and digital writing and reading than Sellen and Harper. Moatty and Rouard (2009), for example, studied the role of reading and writing inside workplaces with a group of technicians involved in engineering training. They found that among this group there was a general lack of training regarding these two activities, especially writing, which involves linguistic, technical, cultural and social competences (2009, p. 61). Furthermore, according to these scholars, organizations tend to underestimate the work that reading/writing implies.

Another study carried out by Moatty et al. (2007, pp. 204–205) showed that when competing with the screen, use of paper was sustained with regard to several typologies of written communication: the loose sheet, the form, printed scientific journals, and the diary. Finally a recent article, again published by Moatty and Rouard (2010, p. 50), reveals that writing continues to be an intense activity in all industrial sectors because it enables the formalization of exchanges, the development of procedures and the provision of traceability processes.

But what has happened in the educational environment with students while these tensions between writing and reading on paper and screen were being researched in the business environment? The aim of this article is to fill this gap and to investigate how the use of digital devices is reshaping the traditional modes of using paper for reading and writing among Students. Students are perhaps the most exposed to reading and writing as their whole life revolves around studying. Although they learned to read and write on paper, at a certain point in their life (depending on which digital generation they belong) they encountered digital devices which, as we know from other research on uses of information and communication technologies (ICT) they use extensively, (Vincent and Fortunati, 2009; Fortunati and Taipale, forthcoming; Hargittai, 2010; Helsper and Eynon, 2010).

But what is still unclear and understudied is the impact of these students' encounters with the computer/Internet, mobiles, tablets and other devices and what it has produced in their practices of reading and writing. As Naomi Baron (2013, p. 135) recalls, so far research on writing has focused on three main factors: language style and writing rules such as spelling, punctuation, editing; length of texts; genre such as formal letter, work report and so on.

On reading, Baron suggests the factors that were considered are more numerous: mode of reading, length of text read, genre, reading speed, memory for and understanding of text and likelihood of annotating or re-reading. However, one first issue around which a consistent part of the debate on writing developed was the attempt to understand if the new digital technologies (mainly the computer/Internet) were damaging writing practices among students or not.

Indeed, concerns have been expressed in several countries that as a consequence of the diffusion of these ICTs the capacity of students to write in a correct way – orthography, grammar, spelling and syntax errors – is deteriorating (Crystal, 2012). In the new millennium this concern highlighted the growing need to measure students' academic capabilities as well as the possibility to compare students' abilities in many countries.

While a number of cross-cultural studies about the reading/writing capabilities of students is available (i.e. Programme for International Student Assessment (Pisa tests)[1] promoted by OCSE at international level, PIRLS[2], The Nation's Report Card,[3] Kaiser Family Foundation Report,[4] National Endowment for the Arts Study[5] and PEW Research[6] in US) their results are not easily comparable and indeed, analysis of this data creates more confusion and contradiction than it does similarities. What we can learn from these studies, however, is that the new generations of digital natives in certain countries have improved their capability to read and write while in other countries it has deteriorated.

Furthermore, as national standards for literacy pedagogy and the adoption of digital devices such as lap tops and mobile phones can be expected to vary by country, the results we discuss herein may be different from countries where taught chirographic writing is being replaced by word processing at a young age. Indeed, in countries such as the US, Canada and the UK, teaching excellence in grammar and syntax has been less valorized than the advancement of cross cultural literacy diversity and the availability of learning via multi-model communications channels open to all globally. For example there is a continuing debate in the US and Canada about cursive writing and whether keyboard skills should be taught instead.[7]

In addition the adoption of digital technologies has followed a different trajectory globally, for whereas Italian youth were among the voracious early adopters of mobile phones before the US, in contrast laptops and the Internet were more commonly used in US schools ahead of Europe – a difference that is less noticeable nowadays. Thus the extent to which this study conducted in Italy is wholly exemplary of the experiences in other countries is a matter for further study.

Following on from this introduction to the extant literature on the topic the next section of this paper is dedicated to reviewing some open questions on reading/writing on paper and on keyboard/screen followed by a section developing an understanding of what digital writing has gained from hand and print writing. The discourse in this second section shows how we have informed and developed the research questions explored in the data gathering for the present study, the method is explained in Section 3. The results of the study are then presented in Section 4 followed by a final discussion as well as suggested directions for future research.

## 2. Some open questions on paper and digital reading/writing

According to Lotman (1977) writing is a secondary system of modellization, which is now largely interiorised in the psyche influencing the mental processes and structures of the personality (Ong, 1989, p. 37). The properties of binomial – reading and writing- are apparently indissoluble: writing always brings with it coding (writing itself) and decoding (reading) since the writers are also their first readers.

But while writers are obliged to read what they write this is not true for the contrary, in the sense that people can read also texts written by others.

The proliferation of the new technologies has changed the historical conflation of reading and writing such that it has now profoundly diverged: while the chirographic8 writing maintained the writing/reading process as a single unit based on the sharing of the same piece of space (we do both these operations on the same sheet of paper), with the electronic writing the process of writing and reading has lost its unity since we write using the keyboard and we read on the screen. The separation of the space of writing from the space of reading has had consequences that have still to be fully evaluated and studied.

The decontextualization of chirographic writing becomes even more serious the more we use electronic writing, as we already learned from Baron (2013).

The alleged loss of the new generations' capability to cope with writing was seen as a serious problem since writing is a fundamental tool for studying (Ong, 1986, p. 27).

Furthermore, writing is also a fundamental tool for societies which are based on a very structured economy and characterized by a peculiar complexity of human relationships as well as by a dense network of hierarchies (Hagège, 1985, p. 66).

It has been argued that without knowing how to read and write it is impossible to make any analysis of phenomena or statements that are based on abstraction and are sequential, classificatory and explicative (Ong, 1986, p. 27).

Indeed, it has become only too easy to burden new technologies with the responsibility of the decreasing capacity of the new generations to write and read. Instead, to identify the causes of this process inside the education system, the family and moreover the whole society, it was much easier to blame the technologies for the disasters that were taking place.

This shortcut in the approach to this problem has emerged by itself despite an apparent lack of evidence to support and other studies that have denied the alleged negative role played by new technologies. Evidence collected by various scholars does not provide a clear answer to this alleged deterioration of writing skills.

Thurlow (2006), for example, who analyzed more than 100 media articles on this topic, found that the most shared conclusion was that texting was damaging formal writing.

Other research projects like that carried out by Rosen et al. (2010) or by Massey et al. (2005) show that texting has a negative impact only in formal writing while in informal writing it has a positive one. A further issue, which became progressively clear, was that students, thanks to the availability of new media, were reconciling themselves with writing and were even beginning to write more.

At least in this sense it is not possible to talk of new media as damaging writing processes, on the contrary, these students had the merit to revitalize the writing process.

That the use of computers favors the writing is demonstrated also by research conducted for the Institute Chronopost. From this study, based on a telephone survey administered to 1004 workers it turned out that only 60% of those who do not own a computer write documents while this percentage rises to 87% in the case of those who dispose of a computer and 93% of those who have a laptop (Moatty and Rouard, 2009 p. 69).

This explosion of writing was already foreseen by Walter Ong (1986, p. 191) who had stated that electronic writing would increase the production of writing.

This phenomenon has certainly entailed changes to the quality of writing (SMS, emails, IM, and so on), since, to manage greater volumes of writing, one needs to speed up both in reading and in writing. But it has not been the only aspect of the question for the writing mode has changed; it has begun to use a more ''oral'', shorter and more immediate writing (Baron, 2000). Naomi Baron (2008, p. 171) includes this aspect also in future scenarios of writing:

(1) writing will increase its importance as a tool for recording informal speech; (2) orthography will be more flexible and personalized; (3) writing will decrease its role for clarifying thoughts; (4) writing will be less and less a social status marker.

This explosion of writing on the World Wide Web brings us to the final issue addressed in this analysis of the broad, scientific debate on the use of new media.
This is the rise of the new figure of 'writers with a lower case w', whose identity and social role is very different from that of the Writers (with a capital W) in the past.
Now, writers perform their various roles as amateurs and not at a wholly professional level. Digital writers have had to become printers and publishers without having any previous know how and competence in handling manuscripts (Baron, 2008, p. 190). Very soon the printer became the faithful companion of the computer because electronic writing could not spread as it did without being able to materialize at a certain point on a sheet of white paper.
The advent of the printer as a peripheral tool of the computer entailed the increase in the paper consumption on the whole in society.9

Furthermore, while publishers were also the owners of the copyright of thebook they published thanks to the contracts they signed with their authors. Online the question of publishing copyright remains very vague, even more so for students who found at their disposal an enormous repository of written texts to be used according their needs.
Roland Barthes' essay (1960) on Écrivains et Écrivants (Writers and normal people who write) offers several ideas for dealing with this issue.
In fact he noticed that in literate countries whereas in the past Writers were the keepers of the written language of the nations, this changed (especially during the last century) so there were other claimants to this role such as intellectuals, politicians and journalists.
In the last twenty years the new information and communication technologies have provided the place where the ranks of those who write can be writ large.

This has meant that while the increase in demand has been accompanied by the massification of culture consumption (DiMaggio, 2009, p. 195), the last two decades have produced the increase of the supply of cultural products (Arvidsson, 2008).
Barthes is the precursor of those who have tried, like Shirky (2008), for example, to compare Writers with those who write.
Many of his reflections are valid also for those who write online. For Barthes (1960, pp. 121–128) Writers perform a function, while those who write perform an activity; the first ''work'' their word by applying technical norms (on composition, genre) and craft norms (patience, correction etc.). In fact, and here we refer to Ong (1986), while with the press the word has become a commodity, the digital culture has a more ambivalent attitude towards words which are in some ways commodities and in other ways voluntary work, craft, and so on (Zwick et al., 2008).

Online we can see the multifarious debate around the topic of user content generation, citizen's journalism, bottom up information, alternative knowledge and more.
Barthes (1960) goes onto explain that Writers are a kind of paid priest of the Great Word, while those who write have a purpose to explain, express, teach, inform, influence of which the word is only an instrument. For the latter the writing supports the doing, it does not constitute it. In their case the writing is traced back to its purpose as a communication tool, and as a vehicle for thinking, but one on which they do not make any technical intervention.
The point here is that the communication projects of writers are generally ''ingenuous''; they are free but also, to a certain extent, ''insistent'', because they propose to society something that society did not request from them. In considering how communications and messages are conveyed nowadays it is worthwhile attempting to understand when the real predominance of writing in the West began. It was in the Renaissance when language had as its primary purpose the fact that it was written (Foucault, 1966, It. Trans. 1978, p. 53) rather than spoken, however this predominance ended in the 17th century, together with the inner relationship between things and words. Thereafter discourse has aimed to say without saying nothing more than what is said.

This glimpse of the philosophical discourse on writing without writing (Foucault, 1966) and the uses and meanings attributed to words and writing highlight just some of the complexities of examining changes in writing and reading practices such as are being explored in this present study. We now examine electronic or digital writing and reading in order to hone the issues explored in this section into two research questions.

## 2.1. What digital writing inherited from hand and print writing

Although chirographic writing has been the most radical innovation, the introduction of the press was probably the most important element in the development of writing and reading, until the diffusion of digital media and in particular use of the computer/Internet.
Eisenstein (1979) shows in detail (although her analysis could not escape criticism of technological determinism) how the press allowed the Italian Renaissance to become European, how it gave the tools to the Protestant Reform, how it reoriented the catholic religious practice, how it influenced the development of modern capitalism, how it changed family life and politics, how it supported the objective of universal literacy and how it supported the emergence of modern science and changed the social and intellectual life. We are still not able to produce an analogous analysis about the role of computers/Internet in our contemporary society.

Digital writing benefits from both handwriting and the press. First of all it inherits from chirographic writing permanence in a limited visual space and, second, silence.
While orality has a sound field, writing has a silent field where a solitary activity takes place. In more recent years multimodal communication via the Internet has introduced sound and music, but we have good reasons to believe that the majority of files in the web are still text files, not multimedia files.
Research going back to 2004 and carried out by Chigusa et al. (2004) on the Japanese web, showed that if the total number of files in total data volume terms is considered, video files lead with a 29.1% share, followed by document and data files (26.0%), image files (25.4%), and audio files (12.1%).
However, although at that time video and audio files accounted for over 40% in total data volume terms, they made up only 0.8% of the total number of files. This reflects the fact that in 2004 the Internet world was essentially a written world and maybe the changes since then have not been so radical.
Third, electronic writing, which has a high capacity of simulation of co-present conversations, has inherited from handwriting a certain amount of isolation and alienation.
In fact, because the words are never fully determinate in their abstract meaning, but assume a sense only in relation to the human body and its interaction with that which surrounds it (Merleau- Ponty, 1962, pp. 181–184), writing creates a de-contextualized language or an autonomous form of verbal communication (Ong, 1986, p. 119).

Starting from this inheritance, the electronic transformation of the word isolates and alienates human beings from the real world and thus from themselves even in a more radical way (Ong, 1989, p. 53). However, for understanding reality humans also need distance – even from themselves (Ong, 1989, p. 53). As Ong argues (1986, p. 245), writing introduces division and alienation, but also a stronger unit, see for example the proliferation of virtual communities, forums and social networks.
It introduces a stronger sense of the self, feeds a more aware interaction among individuals and allows the mind to create new ways of thinking and new ways to search for answers (Ong, 1989, p. 52). Furthermore, as Marshal McLuhan (1964) put it, writing generally develops consciousness, although electronic writing has a great power of mystification of this isolation and alienation because of interactivity.
From the press digital writing has instead inherited both order and clarity.
Writing on a keyboard makes the text clearer and easily readable than handwritten texts. These might be more expressive, but also more unclear. Second, digital writing has inherited the sense of a private ownership of the words and a sense of indignation against the plagiarism.
On this topic, however, digital culture is ambiguous, because it was born with a sense of gratuitousness and freedom but very soon it was challenged by the copyright issue.
In the end, the electronic writing, differently from handwriting, does not have an unconscious. In fact it can be compared, as Ong argues (1989, p. 51) to the conscious aspect of thinking because it has a logical structure (with a pre-defined grammar).
Machines do not feel sensations and this is the reason for which computer cannot really think.
From these theoretical and literary reflections emerges an understanding of how electronic writing has built its status at the same time as handwriting and the press.

However, it does not emerge as a systematic map of its virtues and defects when compared to handwriting and the first objective of the present study is thus to fill this gap. Hence, our first research question is:

RQ1: How students, as a particular category of writers (with a small w), perceive the affordances of electronic reading/ writing when compared to writing/reading on paper?
There is also a second research question, which stems from our desire to challenge a particular theory, called the ''media richness theory'' postulated by Daft and Lengel in 1984 and updated in 1986. This theory ranks the richness of communication mediums on the basis of the capability of a single medium to convey visual social cues, such as body expressions - in particular gestures. Mediums that can convey a higher number of channels of communication such as linguistic, paralinguistic, gestures, kinesics, prossemics, and which are able to recreate a good surrogate of social presence in a timely manner are considered richer.

Mediums that can convey only a few modes of communication and thus take a longer time to convey understanding are considered less rich.
The supposition is that the richer the mediums, the more effective they are in respect to conveying a message with a low level of uncertainty and ambiguity, and the more capable they are of creating a greater immediacy and warmth of the communication, because of the greater number of channels.
The theory of media richness has received much criticism from many scholars including a criticism regarding its application with the new media such as in El- Shinnaway and Lynne (1997).

However, we believe that this theory can still be used heuristically for examining new media. Accordingly we draw on this theory in order to ask if in principle, reading and writing in a multimodal communications media convey richer communication in terms of sensorial and emotionally intense experiences. Our second research question is thus the following:
RQ2. Have electronic writing and reading become richer experiences than paper writing and reading? Starting from media richness theory, we might expect that these students, being used to dealing with reading/writing electronically, could find the correspondent operations on paper more old style and poor than the correspondent at the digital level.
Hence they may perceive the paper world is less rich in possibilities than the electronic world. Obviously our expectations also consider aspects of social ritualization related to these tasks which must be submitted necessarily to relevant changes in this shift (and maintenance at the same time) from the paper to the digital.

## 3. Method

Our aim for this present study was to explore the living experience of a group of 151 students with regard to their reading/ writing on paper and their digital reading/writing in order to understand how reading/writing are now reshaped after the advent of ICT use in this context.
This study is part of a broader research project carried out at the University of Udine and involving the 127 undergraduate students of the course on Sociology of Communication and Culture as well as the 24 graduate Masters students of the course in Multimedia Communication and Technologies of Information.
This study intended to investigate reading/writing on paper and digital reading/writing, gestures and postures while reading/writing in both the situations and finally the type of use of the computer/Internet. In this paper we examine the results only from the graduate Masters students that relate only to reading/writing.

These students are particularly sensitive to the issues that relate to the two modes of writings not least because the study of the peculiar affordances of new media is part of the syllabus in their course.
But, furthermore, as with all academic students, they know very well from their personal experience how hard it is to write, as well as to understand the positive effects of the writing itself, for when writing they are obliged to reflect and to formulate clearly their feelings and thoughts.

Thanks to this activity it is anticipated that, as with all those who write, they experience a greater awareness of themselves and of their skills, a sense of personal and intellectual empowerment and even an enrichment of their personality (Schick, 1960, p. 357), while also achieving a separation from others which the act of writing always involves (McLuhan, 1964).

A good command of reading/writing is a fundamental competence for all students, not only in their educational development but also for their future professions.

As students attending a such course they are a very relevant target to be involved in a research on reading/writing since they are routinely involved in these two modes of writings and particularly aware and sensible towards the topics of the current study.

We asked the students to freely write their reflections on the following four themes, the first two of which we focus on in this paper:

(1) Describe the differences you find when using a pen and using the computer. Furthermore describe what you like and dislike about both these modalities.

(2) Describe which differences you find in reading paper and reading on a screen. Furthermore, describe what you like and dislike of both these modalities.

(3) Think now of the gestures and postures you assume in reading and writing using paper and on a screen. Reflect and describe them.

(4) Think now to your use of the computer/Internet. This tool allows multimodal communication (images/videos, texts and sounds, music and so on). How do you use it? Reflect on your personal experience and then describe it.

The fourth theme was investigated simply to understand the specific type of multimodality used by these students. Here we report, for space reasons, only on their answers to points 1 and 2, although it is impossible to do so without proffering further valuable information regarding the other questions. We did not give students any other instruction on how to write about each theme because we were interested in their spontaneous thoughts.

Thus an essay like this might be considered like the answers to four open questions.

The decision to build the research tool in this feature has been dictated by the desire to have an instrument which, if compared to a classical questionnaire, could be less influenced by the interaction between the researcher and the object of study and thus could present less distorting effects.

From a formal point of view, the texts obtained have been analyzed as artificial documents that allow more expression and spontaneity in the content. These texts were studied by means of content analysis. They were broken down into categories of discourse with the purpose of capturing the most relevant discursive frames recurring in these essays and regarding perceptions, ritualization, gestures, emotion and especially sensations of reading/writing off and online (Altheide, 1996). While the frequencies of the categories were calculated and the most recurrent ones singled out, those categories with relatively few frequencies but which are significant to enlighten or clarify some points of our analysis were also retained and discussed, as David Silverman (1997) suggests.

This has allowed us to trace a conceptual map of the experience on reading/ writing outlined by these students and to build a classification scheme, useful in describing the most important issues discussed in an analytical way. The content analysis applied in this way is markedly non-intrusive and a very flexible methodology (McNeill and Chapman, 2005).

## 4. Results

As suggested by our application of media richness theory to the development of our research questions the essays written by the respondents provided a rich source of material for this study. We present the results in this section by using the students' words transcribed directly from their essay and shown in italics10 so as to avoid diluting their contributions.
This richly illustrates the topics being discussed as well as providing new material for discussion of the research questions, especially with regard to contrasting writing on paper and writing on screen about which there is less extant literature. As already discussed in the process of digitalization the two facets of binomial reading/writing have suffered a different fate. Hence it is more useful to analyze reading separated from writing precisely because they have reacted to digitization in a different way.

Accordingly we now present the results in four sections in which the main advantages and disadvantages of reading on paper and on screen and writing on paper and on a keyboard are reported. In some instances we have separated the information provided by the respondents to accord with this structure; obviously not every student provided information without cross-referencing and contrasting their information as they wrote their answers, and in these instances we have summarized the relevant information.
We must also assume that the students' evaluation of both the writing modes might
be influenced by the exercise given to the students as well as by their personal ability.

### 4.1. Writing on paper

Writing on paper is considered more immediate than writing on a keyboard, in the sense that, for example, it does not need any software. Moreover it is the most personal and portable experience for Pierluigi F. The pen and the paper often disappear from the little objects of everyday life which one transports perhaps because they are in competition with the mobile phone and laptop (something that continues since Flügel (1930) first noticed this as a major problem with clothing). Writing on paper is, furthermore, seen by these students as more free if compared to the fixity of the keyboard since one is not obliged to link handwriting to a certain type of paper or even to paper, as suggested by Roberto O:

*''We can potentially write everywhere, on walls, on the earth, on paper, on glass. So there is a freedom of choice of space and*
*surface on which to write by hand.''*

*This greater freedom also involves the fact that one can write at any moment and in any situation, and in anyway that one* prefers:

Another aspect of this freedom resides in the fact that I can manage the flow of writing. I can safely write diagonally from a certain point of my writing. (Roberto O.)
The paper gives more room for creativity: often people design and doodle at the edges of a sheet while they think of what to write.

Writing on paper is a personal but also personalized performance because it reveals the personality of that singular hand writing, which can be captured by the reader and even be analyzed through graphology (Yuri D.P.).
But handwriting reveals not only the personality, but also the emotions of the writer.

Giovanni L. writes: writing by hand says much more than what is written: from the pen stroke in fact can be understood the emotion of those who write: safety and strength of a strong character trait contrast with the weak and trembling strokes of those who are begging or
*are showing themselves to be extremely fragile.*

*On this note, Fabrizio C. stresses that:*
having to pick up a pen, hold it in your hand and being able to touch and feel the paper texture, gives a feeling of responsibility and attachment.

And finally Giulia R. points out that:
in addition to being the first mode which is being taught to write, it has always been thought of as a vehicle to express emotions.

In fact, the handwriting manages to shine through its simple characters a high emotion, the same one that pervades the writer. Another recurrent theme in these essays is how seeing on paper the writing of somebody we love can give us intense emotions. However these emotions are connected not only to the writing on paper but also the paper and its physical characteristics. First of all the paper is soft to the touch.
With the paper, writes Pierluigi F., there is a tactile experience and almost an extension of one's own hand which can be done only by the pen. When studying the use of writing with a pen, – perhaps on account of a better continuity of the system of hand
*and pen and then ultimately of the body, facilitates memorizing.*

*Furthermore, writes Yuri D.P., when I write by hand I tend to get closer to the hand and the sheet. The white piece of paper* helps to express, Barbara J. adds, all of me, to let off steam by writing the thoughts that go through my head at that moment.
Writing on paper, stresses Paola B., for me is more simple and natural, fast and fluid. For Carlo E. the handwriting makes the writing more authentic and personal.
Additionally the paper often smells of ink. It is clear that writing on paper can be perceived as a multi-sensorial experience.
Moreover, writing on paper often deals with aesthetics. Roberto O. writes
Writing on paper can assume an artistic shape because the same written letters are never the same and each of us, over time, *creates our own writing: embellishments of letters, slant of the text, intensity of the stroke.*

*In certain circumstances it becomes in fact an artistic practice. In China and in Arab countries calligraphy continues to be* a form of art even nowadays. Stefano G. uses the following words to build upon this notion: handwriting can be a pleasant and elegant experience.

Writing on paper engenders a greater dexterity than writing on a keyboard. It is true that on paper we use only one hand while on a keyboard we use both, causing us to involve the two hemispheres of the brain. However, handwriting makes us develop greater dexterity which, in turn, has important repercussions at a cognitive level. This has begun to be a problem since a certain debate developed in medical fields about the loss of dexterity of young generations of students which has serious implications for those who want to specialize in surgery.
Furthermore, writing on paper is much more ductile than writing on a keyboard. It is better for writing formulas or schematics. I can pass from writing words to draw diagrams and I can pass from one side to the other of the sheet more easily, argues Matteo C.

Matteo C.
Writing on paper favors the process of a complete formulation of sentences. Jury D.P. states:
writing with a pen is much slower and promotes the formulation of sentences, in particular a handwritten phrase is usually already fully formed in one's head (due to the difficulty of subsequent corrections).

Writing on paper is the ideal mode for taking notes and it is also good for the first draft of a text. Moreover it also allows a greater diversification of writing tools.

As Mandra M. points out:
I use mainly pencils and colored pencils and fine tip markers (highlighting and emphasizing allow me to memorize better). If these are the virtues of writing on paper, what are its defects? They are not numerous, but they do exist. First of all, there is the possibility to making one's fingers dirty. Second, writing on paper is slower than on a keyboard.

Mandra M. points out
I ammuch slower because I feel a sense of discomfort in the hand (I definitely lost hand dexterity over time due to the use of the keyboard).
I have extreme difficulty in cursive writing therefore I use the letters with the inevitable loss of ''personality'' (mostly related to writing in italics).

During writing on paper, the use of aids such as a dictionary or thesaurus is more complicated and interrupts the rhythm of writing.
Furthermore, students often talk of discomfort in the hand because they have lost the constant habit of hand writing; and it is noted that writing on paper has always created problems of scoliosis because of the asymmetry in the use of the right and the left part of the body.
After a while the quality of handwriting worsens: something that we noted as recurrent in the essays delivered in this present study. Moreover the handwritten text is not always easily readable by others and sometimes also by the authors of written texts themselves. The layout of the text has less order and precision than electronic writing and thus the text appears more messy.

Marta M. writes:
therefore I use sheets with squares that allow a better management of space.

Corrections are obvious and this sometimes might be embarrassing and hence creates the necessity to make a fair copy of the draft. Sara F. states:

the paper keeps track of all our thoughts, erasures, phrases, rewritten, cut parts, all signs that bear witness to the evolution of our thoughts.

It is more difficult to share the information on paper with others, writes Fabrizio C.
The handwritten paper brings with it a sense of uniqueness, which can be overcome technologically by means of a photocopier, while printed paper does not have this limitation at all.

## 4.2. Writing on a keyboard

The first affordance of writing on a keyboard is that this kind of writing is enhanced by automatic correction of orthographic, grammatical and syntactical mistakes, by having easy access to dictionaries of synonyms and antonyms, vocabularies, layout etc.
All these facilitations are immediate and easy to use and this makes the experience of writing for these students very rewarding. Another great affordance of digital writing is that it is possible to move things inside the text.

As Roberto O. points out
One of the principal advantages is the possibility to intervene ... on the position of sentences and paragraphs within the text, in real time. This allows a gradual preparation of the final text, which does not happen normally in writing by pen (writing the ''draft'' and a fair copy of transcript). The progressive drawing up of the text has both virtues and defects: it makes the writing process very flexible and progressive but also favors a fragmentation of the thinking process. It is important to note that when one writes on a keyboard the layout can be done where appropriate.
The progressive drawing up of the text is described by Yuri D.P. in the following way writing on the computer is much more subject to change as you type: very often it happens that one replaces many terms in a sentence originally thought and the after thoughts/corrections increase with each rereading of the text (just writing this short phrase in fact I already made a dozen of substitutions and changes).

The keyboard is less exhausting on the hands and above all this is not detectable in the final product, states Pierluigi F. Digital writing is characterized by rapidity, thanks also to the programmes of predicted text that self-complete words; it also implies standardization of the text which brings with it harmonious order and easier reading.
In fact digital writing is good for the final version of a text and is appropriate also to work and formal correspondence.
Moreover, writing on a keyboard presents the possibility to give a particular emphasis to some words or sentences by the use of different fonts and characters to modify the text easily in any moment and in many ways.
The possibility of copy and paste or highlighting, for example,

the ability to create hyperlinks, to structure in a uniform and mechanical manner indices of text, tables, and diagrams, are particularly important because they diminish the effort and time of writing, underlines Tommaso V.

The text moreover can be duplicated and diffused in few seconds. So there is a saving of time and a greater functionality. (Giovanni L.)
The fact that it is possible to achieve an immediate sharing of what one writes and also an immediate updating of the content as needed has an unparalleled value.
Finally, writing on keyboard allows interactivity and hypertextuality.
The ideal would be to write on a keyboard but read on print paper because reading the words from the screen is not always comprehensible.

Finally, writing on a keyboard however maybe is the first phase of a process which is intertwined with the paper.
In fact in many cases the text written on the screen has the need to be printed for a proper reading and correcting. Then the corrections are reported on the computer and a new version is made which might have another printing for another proper reading. (Anna L.)

There are some negative aspects: first of all between the writer and the production of a message there is a hardware/software interface which makes the contact with the message mediated and no longer direct. This mediation is a vehicle of distraction. Fabrizio C. writes

We passed from an almost total immersion of the writer in the context of writing to a writing process inserted inside a much broader context that provides much food for distraction and decontextualization.

Furthermore writing on the computer, as Roberto O. writes:

constrains us to use a predetermined space from the program that we are using and we have to use additional tools to change the way we write.
But this question is even more complicated in the sense that between the computer and the writer there is a certain distance (generally 80 cm).
This greater distance than writing on paper surely has an influence on the intimacy of the writing process, which of necessity on the computer becomes less closely connected.
Computers are more fragile than a pen, we must be careful to not break them, to not block the air circulation, the duration of the battery, to avoid the sun reflecting on the screen and so on, states Sandi F.
Too often technical problems impede writing.
Furthermore, there is a risk of losing the text or the data we are working on (Tommaso V.).

Moreover electronic writing hides the process of writing and makes it disappearing by subtracting the memory of it.
Yuri D.P. underlines that digital writing implies frequent errors of typing or transposing letters in typing.
Furthermore it represents a less expressive, stylish and personal activity if compared to writing on paper.

And because it lacks a personal calligraphy electronic writing brings with it a de-personalization as well as some de-contextualization as it is inserted in a broader context which offers opportunities for distraction – seeing advertising, hyperlinks and so on.
It implies that the writer must have a printer to print the document produced on the computer.

Although the writing on a keyboard can be invaluable, argues Jacopo T:
the computer is not able to simulate the ease with which the writer by hand can control the sheet of paper: by writing by pen you are not obliged to deal with the mandatory constraints of rows, you can switch between upper and lowercase letters, you can create columns, boxes, bulleted lists, change color and return symbols with a speed and ease that is unmatched by the writing on a keyboard.

Finally if the human body has always suffered with writing on paper, things are not improved by passing to the keyboard.
In fact, we passed from the callus of writer between the index and the middle fingers on paper to the tendonitis of writing on a keyboard, argues Pierluigi F.

## 4.3. Reading on paper

The reading on paper and on the screen can be indifferent, writes Yuri D.P., if the text to read is short. If it is long it is much better in general to read on paper than on screen.
Furthermore the differentiation of reading on paper and on screen is also connected to the typology of the text to read.
If the text is pleasant the paper support is preferred, if the text requires strategic reading (technical or scientific texts or work texts) the screen is preferred as it means to have at disposal a PC and all the applications connected to it, such as font change, zoom, cut and paste, web access, calculator.

Among the positive aspects of reading on paper there is the fact that written texts do not tire the eyes, are more easily transportable and do not lose their characteristics in case of accidental damage.
Furthermore, they allow more freedom of movement and postures. The strategy of speed reading is also more applicable.

Reading, writes Fabrizio C., is a process of immersion of one's own mind through concentrating one's attention on a text and thus is more focused on a paper than that on screen.

Furthermore it is also more relaxing, points out Anna L. The physical contact with the paper offers a ''plus'' which is lacking in the digital reading. When reading on paper I can vary my posture, flip through the pages and actively intervene physically (and in a more ''natural'' way) on the text with notes and annotations or underlining passages, writes Anna L..

As Yuri D.P. adds, in these cases there is the possibility to underline and write notes and comments. Very long texts as books are more easily accessible, because reading on paper is less fatiguing than reading on a screen.

The reading on paper, points out Carlo E., is immediate and carefree because we do not have to worry about the electricity, the battery and the access to the Internet, as in the case of the computer. One aspect which is clear in these essays is that reading on paper is a more focused action when compared to reading on a screen. For example Fabrizio C. writes:

I read on the screen while I cook, I study, I look at the television. When I read on paper, I just read. And I do so in a more relaxed and focused way. When I read on my iPhone I could be with my friends and have a beer or take a walk downtown.
It cannot be the same concentration that it would be if I read the same messages on paper.

## 4.4. Reading on screen

Reading on screen has stimulated fewer positive comments and this probably because this is the weak point of the digitalisation of the entire writing process.
Among the virtues of reading on screen there is the fact that I can easily find the words on a text and I can search keywords in research engines (Mandra M.).
Of the digital reading, writes Yuri D.P., I like the fact that I can choose the light and also that I can read in the dark; I like also the impersonality of characters which, in formal texts, makes the reading conform to the content.
Regarding the negative aspects, reading on the screen is harder and depends on the typology and dimension of the screen.

Consider also the sight problems about which almost all the students complain. Furthermore another recurrent theme in these essays is the fact the reading on screen implies more eyestrain compared to reading on paper.
What I also do not like is the physical tiredness that it implies and the size of the screen which is much less portable than a book, points out Yuri D.P.
It is not always possible to insert comments (online documents or pdf) (Mandra M.).
Not to mention the de-personalization of the text written on keyboard.
It is less focused and linear: see eye-tracking research which shows that the readers while reading jump, often they do not arrive at the end of the line because in the meantime they have made several jumps and their attention, very probably has been captured by other elements.

At the same time reading on screen is more invasive because there are the advertising banners, links to other sections or other content of the website, links with other websites, various graphic artefacts. (Fabrizio C.)
The reactions to e-books are not all enthusiastic among these students as Pierluigi F. for example writes: as to the e-book readers I find that they are too delicate and unnecessarily capable to store thousands of books, when in principle one reads one or two at a time and one hardly needs to carry an entire library.

## 5. Discussion and concluding remarks

The final discussion of our results enables us to answer to our two research questions.
In respect to RQ1: How students, as a particular category of writers (with a small w), perceive the affordances of electronic reading/writing when compared to writing/reading on paper?
The current study has highlighted several points, which confirm the theoretical analyses developed by scholars such Barthes (1960), McLuhan (1964), Foucault (1966) and Ong (1986, 1989) and enrich the empirical research carried out so far on this topic and discussed in the introductory sections (i.e. Sellen and Harper, 2002 and Baron, 2008, 2013, forthcoming).

The **first**, and surprising result is that writing on paper emerged as a task that has many more virtues than defects for our students. This result confirms a similar outcome reported by Naomi Baron (forthcoming).
The meaning of this is however unclear: should it be interpreted as a kind of nostalgic link with old technologies or as the fact that writing on paper will continue to have a secure future? To understand this meaning it is necessary to produce new research.

**Second**, we noticed that the textual production of these students is much larger with regard to writing than reading, as anticipated by the classics we discussed and as explored by other theorists of new media such as Shirky (2008), Arvidsson (2008) and Zwick et al. (2008).
Also this data confirms the current broader interest by people towards writing that we have underlined before as well as confirming that probably today there is a reversal of the asymmetry of reading and writing in favor of the latter.
After centuries in which people were essentially readers, now they are mainly writers.

**Third**, writing on paper turned out to be a metacommunicative activity as it conveys many more things than simply the written word in the form of the aesthetics, the emotions and the personality of the writer, for example.
As regards the aesthetics, Hagège (1985, p. 80) argues that writing has tended to include aesthetics since it originated and that Egyptian hieroglyphics or Chinese calligraphy convey an array of aesthetic and intimate messages.

**Fourth**, reading/writing on paper seems to be a much more multi-sensorial experience than reading/writing on screenkeyboard.

Even the paper itself is able to convey a multisensorial experience.
On the whole, the emotional and sensorial experience on reading/writing on paper is much stronger than the digital one. From our research it emerged that handwriting on paper involves more of the body than the electronic typing on keyboards.
These students discovered what in the middle age Orderic Vitalis had already understood, that is that in the physical act of writing it is the entire body that is at work (Clanchy, 1979, pp. 88–115; Mangen, 2008).

**Fifth**, reading and writing should not be understood as simply communicative acts but as processes, in which the different technologies (pen/paper, keyboard/screen) enhance the different phases of them, as Sellen and Harper already noted in 2002.
These processes not only remain a decade later, but they organize themselves in a peculiar way according to the different sectors and contexts in which they are examined as this research shows.

**The sixth** aspect is that electronic writing, which is a great facilitator of the writing process, has had the effect of developing the production of writing, while it has not enhanced reading as well, which has moved forward little with the changing technologies.
This is a very important gap to fill and it is worth highlighting that reading is the Achille's heel of the digitalisation process, as already argued by Fortunati in 2010. If more technological innovation is needed in this process it is reading that requires it most.
The effect of all this for now is that people read and appear to study less while they write more.

**Seventh**, writing on a keyboard is a kind of 'augmented writing', because it is enhanced by the automatic corrections of orthographic, grammar and syntax mistakes, by the possibility of using dictionaries, vocabularies, automatic translators.

For these generations of students who have lost competence on the language at this level, being supported by all these tools is fundamental and explains also the resurgence of writing that has occurred with the new media. Even the 'notorious' copy and paste is considered by them as a tool to speed up writing. However, from another perspective electronic writing further promotes the loss of memory in comparison to the chirographic writing since by helping writers on orthography, grammar and syntax it de-empowers them.
When writers have a doubt or make an error they are no longer pushed to check the orthography nor refresh the grammar rule but simply they are pushed to rely on the automatic correction system, as discussed by Baron in 2008.
This blind trust on spell check is part of the ingenuous attitude that Barthes (1960) attributed to writers with small w. Spell check, because it is automatic, can entail mistakes and add other mistakes to the text (Collins, 2011).
Electronic writing thus appears to make people increasingly dependent and weak with regard to their writing abilities by hiding their loss of competences as Victoria Tucker argued (2011).

Now, digital natives have learned to write by outsourcing the knowledge they have lost (grammar, syntax etc.) to overcome their loss of knowledge;
things that at certain moments in the past may have discouraged their written production. Pedagogical practices that deemphasize writing skills, particularly grammar, also limit opportunities for excellence in writing and are a continuing topic of debate in many countries (The New London Group, 1996; Budra, 2010).
Writing, is now becoming not only more dependent on language facilities and support but also more standardized and speedy, while as an activity it has become more intense, and almost overused and devalued.

However, although writing on a keyboard saves time and offers greater functionality, at the same time there is a shared awareness among these students, and this is an addition to the debate, that electronic writing increases the separation between the body and the product of its communicative activity.

Between the subjects and their messages in fact there is a hardware/software interface which means it is losing the contact with the message itself.

However, and here is the seventh aspect, the electronic writing has the potential, in comparison to the chirographic writing, to be a further element of diffusion of the writing and of its diffusion in the everyday life, as well as in the domestic and reproductive sphere. However, like the chirographic writing, electronic writing is closely associated with the last reference to the text because in the text is incorporated dead work, finished tasks never to be revisited or repeated.

This huge production and consumption of texts decreases the contact with living agents in our lives. But this greater presence of death in our production/ consumption of texts, separated from human living world at the same time assures to them the possibility of immortality in perpetuity and in many different living contexts, thanks to a potentially infinite number of readers, as Ong, stressed already in 1989.

An aspect that did not emerge clearly in this research is that there is not an opposition between a writing understood as ‘‘natural’’ and opposed to an electronic writing perceived as ‘‘artificial’’. This aspect instead is very present in the cultural debate about writing. Both are highly artificial. But saying that they are artificial does not mean to devalue them. Both chirographic and electronic writing are essential for the development of human, inner life, because they increase the level of our awareness (McLuhan, 1964).

In fact today we can talk of the unique process of writing and reading in which reading/writing on paper comprises specific phases of this process (like, for example, in taking notes) and reading/writing on keyboard/screen comprises others such as for example, making the definitive version.

With regard to the second research question the results would appear to be unequivocal. RQ2. Have electronic writing and reading become richer experiences than paper writing and reading? From the results presented here this study suggests that multimodal communications media do not automatically convey richer communications in term of sensorial and emotionally intense experience.

On the contrary multimodal communication media is barely able to offer the multi-sensorial experience enabled by reading/writing on paper.

Looking to future directions of this research, it would be very worthwhile to investigate these issues with a more robust sample (this study in fact was limited to illustrations of the perceptions of a small group of very specific people: graduate Masters students on multimedia communication and technologies of information) and also at cross-cultural levels.

We noted that students in some countries improve and in other regress with regard to their capability of writing and reading.It would be worthwhile to see if there is a correlation between this improving or worsening with the perception these students have of paper and digital reading/writing. Second, there is the need to activate methodologies provided by other disciplines, such as ergonomics, education, cognitive and neurosciences, medicine, human computer interaction, linguistics, to be used for complementing the study with a series of laboratory based experiments on people writing/reading on paper and on keyboard/ screen and with a series of tests in order to collect more objective data.

## Acknowledgements

A first version of this article was presented and discussed by the authors at the first meeting of COST Action FPS 1104 ‘‘New Possibilities for Print and Media Packaging: Combining Print with Digital’’, Helsinki, 15–16 October 2012 and at the AOIR conference ‘‘Internet Research 13.0: Technologies’’, Salford, 18-21 October 2012.

## References


Arvidsson, A., 2008. The ethical economy of customer coproduction. Journal of Micromarketing 28, 326–338. Altheide, D.L., 1996. Qualitative Media Analysis. Sage, Thousand Oaks.

Baron, N.S., 2000. Alphabet to E-mail: How Written English Evolved and Where It's Heading. Routledge, London and New York.

Baron, N.S., 2008. Always on: Language in an Online and Mobile World. Oxford University Press, Oxford and New York.

Baron, N.S., 2013. Do mobile technologies reshape speaking, writing, or reading? Mobile Media and Communication 1 (1), 134–140.

Baron, N.S., forthcoming. Reading in print versus onscreen: better, worse, or about the same. In: Tannen, D., Trester, A.M. (Eds.), Discourse 2.0: Language and New Media. Georgetown University Press, Washington, DC.

Barthes, R., 1960. Écrivains et écrivants, Arguments, reprinted in Essais critiques. Seuil, Paris, 1964.

Budra, P., 2010. The case for teaching grammar. Canadian Education 50 (4), 12–16.

Chen, N., Guimbretiere, F., Sellen, A., forthcoming. A comparison of tablets, windows, and paper reading surfaces in support of active reading. ACM Transactions on Computer–Human Interaction.

Chigusa, S., Hiroya, S., Shinya, T., 2004. Report on Statistical Survey of World Wide Web Content. Web Content Amount as an Indicator of Internet Development in Japan. Institute for Information and Communications Policy, Ministry of Internal Affairs and Communications.

Clanchy, M.T., 1979. From Memory to Written Record: England. Harvard University Press, Cambridge, Mass, pp. 1066–1307.

Collins, F., 2011. Technological impacts on writing. Technologies of Writing 8, 1–2.

Crystal, D., 2012. Spell it Out: the Singular Story of English Spelling. Profile Books, London.

Daft, R.L., Lengel, R.H., 1984. Information richness: a new approach to managerial behavior and organizational design. Research in Organizational Behavior 6, 191–233.

Daft, R.L., Lengel, R.H., 1986. Organizational information requirements, media richness and structural design. Management Science 32 (5), 554–571.

DiMaggio, P., 2009. Organizzare la cultura. Imprenditoria, Istituzioni e Beni Culturali, Bologna, Il Mulino.

Dillon, A., 1992. Reading from paper versus screens: a critical review of the empirical literature. Ergonomics 35 (10), 1297–1326.

Duffy, T.M., Waller, R.H.W. (Eds.), 1985. Designing Usable Texts. Academic Press, Orlando, Florida.

Eisenstein, E., 1979. The Printing Press as an Agent of Change. Communications and Cultural Transformations in Early-Modern Europe. Cambridge University Press, New York.

El-Shinnaway, M., Lynne, M.M., 1997. The poverty of media richness theory: explaining people's choice of electronic mail vs. voice mail. International Journal of Human–Computer Studies 46, 443–467.

Flügel, J.C., 1930. The Psychology of Clothes. International Universities Press, London.

Fortunati, L., 2010. Some thoughts about Electronic Textuality. presented at the exploratory workshop Electronic Textuality, organized by COST and ESF, 15– 16 June, Istanbul.

Fortunati, L., Taipale S., forthcoming. Mobile phones and digital generations in EU5 countries: a comparison of the 1996 and 2009 survey data.

Foucault, M., 1966. Les Mots et les Choses. Gallimard, Paris (It. Transl. Le parole e le cose, 1978, Rizzoli, Milano).

Gaver, W.W., 1991. Technology Affordances in Proceedings of CHI'91. ACM, New York, pp. 79–84, (New Orleans, Lousiana, April 28–May 2 1991).

Gould, J.D., Grischowsky, N., 1984. Doing the same work with hard copy and cathode ray tube computer terminals. Human Factors 26, 323–337.

Hagège, C., 1985. L'homme de parole. Contribution linguistique aux sciences humaines. Librairie Arthème Fayard , Paris (It. Transl. L'uomo di parole. Linguaggio e scienze umane. Einaudi, Torino, 1989).

Hargittai, E., 2010. Digital na(t)ives? Variation in internet skills and uses among members of the net generation. Sociological Inquiry 80 (1), 92–113.

Helsper, E.J., Eynon, R., 2010. Digital natives: where is the evidence? British Educational Research Journal 36 (3), 503–520.

Hillesund, T., 2010. Digital reading spaces: how expert readers handle books, the web and electronic paper. First Monday 15, 4–5.

Lotman, J., 1977. The Structure of the Artistic Text. University of Michigan, Ann Harbor.

Mangen, A., 2008. Hypertext fiction reading: haptics and immersion. Journal of Research in Reading 31 (3), 404–419.

Massey, A. J., Elliott, G. L., Johnson, N. K. 2005. Variations in aspects of writing in 16+ English examinations between 1980 and 2004: vocabulary, spelling, punctuation, sentence structure, non-standard English. Research Matters. Cambridge Assessment Directorate, Cambridge Local Examinations Syndicate.

McLuhan, M., 1964. Understanding Media. McGraw-Hill Book Company, New York.

McNeill, P., Chapman, S., 2005. Research Methods. Taylor & Francis, Inc., Philadelphia.

Merleau-Ponty, M., 1962. Phenomenology of Perception. Routledge, London.

Moatty, F., Rouard, F., 2009. Lecture et écriture au travail: les enjeux en termes de formation et de conditions de travail. Formation Emploi 106, 59–72.

Moatty, F., Rouard, F., 2010. L'écrit au travail et ses déterminants chez les salariés en France en 2005. Travail et Emploi 122, 39–52.

Moatty, F., Rouard, F., Teiger, C., 2007. Lectures pour soi, lectures invisibles. Une cartographie des lectures au début de l'internet. In: de Saint-Laurent Kogan, A.-F., Metzger, J.-L. (Eds.), Où va le Travail à l'ère Numérique? Les Presses de l'Ecole des Mines de Paris, Paris, pp. 197–210.
O'Hara, K., Sellen, A., 1997. A comparison of reading paper and on-line documents. In: Proceedings of CHI'97 ACM, pp. 335–342.

Ong, W., 1986. Oralità e scrittura. Tecnologie della parola. Il Mulino, Bologna (original edition Orality and Literacy. The Technologizing of the Word. Methuen, London, 1982).

Ong, W., 1989. Interfacce della parola. Il Mulino, Bologna (original edition Interfaces of the Word, Cornell University Press, Ithaca, 1977).

Rosen, D., Chang, L.J., Erwin, L., Carrier, L.M., Cheever, N.A., 2010. The relationship between textism and formal and informal writing among young adults. Communication Research 37 (3), 420–440.

Silverman, D. (Ed.), 1997. Doing Qualitative Research: Theory, Method, and Practice. Sage, London.

Schick, C., 1960. Il linguaggio. Natura, struttura, storicità del fatto linguistico, Einaudi, Torino.

Shirky, C., 2008. Here Comes Everybody: The Power of Organizing Without Organizations. Penguin Press, New York.

Sellen, A., Harper, R., 2002. The Myth of the Paperless Office. MIT Press, Cambridge.

Suchman, L.A., 1987. Plans and Situated Actions: the Problem of Human Machine Communications. Cambridge University Press, Cambridge UK.

The New London Group, 1996. A pedagogy of multi-literacies: designing social futures. Harvard Education Review 66 (1), 60–92.

Thurlow, C., 2006. From statistical panic to moral panic: the metadiscursive construction and popular exaggeration of new media language in the print media. Journal of Computer-Mediated Communication 11 (3).

Tucker, V., 2011. Spelling: does technology help or hinder our ability to spell words correctly? Technologies of Writing 8, 1–2.

Vincent, J., Fortunati, L., 2009. Electronic Emotion: The Mediation of Emotion via Information and Communication Technologies. Peter Lang, Oxford.

Waller, R.H.W., 2012. Graphic literacies for a digital age. The survival of layout. The Information Society 28 (4), 236–252.

Zwick, D., Bonsu, S.K., Darmody, A., 2008. Putting consumers to work: co-creation and new marketing govern-mentality. Journal of Consumer Culture 8, 163–196.