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The history of education in times of paradigm shift: new ways of thinking and old ways of looking

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Abstract: This paper will seek to examine the topic in light of its historical antecedents. The purpose is to reflect on digital information and the production of meaning in historiographical practice. The aim is to examine the mechanisms by which educational research has occurred online, investigating the impasses and difficulties created when on-screen research is contrasted with research in printed documents and bibliographies. However, it is possible to affirm that other moments in the history of Western culture have already encountered significant technological changes that challenged previous ways of dealing with knowledge. Therefore, with a view to exploring the future, this text should examine the paths of the past, seeking to identify other periods of inflection that gave rise to technical innovations, thereby producing transformations in literate and public behavior. What academic research strategies were employed in the past to produce meaning? And, by analogy, today, what would be the dynamics involved in new forms of research that transform or alter procedures, rituals, and practices inscribed in the historiographical process? These are ways of thinking and ways of seeing: paradigm shifts in the construction of research work.
Keywords: history of reading; history of education; digital culture; press; literate culture.

1 Introduction

This article seeks to examine the topic in light of its historical antecedents. The proposal is to develop reflections on digital information and the production of meaning within historiographical practice. The objective is to investigate the mechanisms through which educational research has taken place within the territory of the internet, questioning the impasses and difficulties produced when screen-based investigation is confronted with research based on printed documentation and bibliography. However, it is possible to state that, at other moments in the history of Western culture, major technological changes have already challenged previous ways of dealing with knowledge. Therefore, with a view to future prospects, this text will examine pathways from the past, seeking to identify other periods of inflection that gave rise to technical innovations, thereby producing transformations in literate and public behavior. Which academic research strategies were historically employed for the production of meaning? And, by analogy, today, what dynamics are involved in new forms of research that transform or alter procedures, rituals, and practices embedded in

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historiographical work? These are ways of thinking and ways of seeing: paradigm shifts in the construction of investigative work.

Walter Ong, addressing the relationship between orality and written culture, emphasizes that among the tens of thousands of languages spoken throughout history, "[...] only 106 have been subjected to writing to a degree sufficient to produce literature — and most have never been written" (Ong, 1998, p. 15). At present, of the 3,000 spoken languages that still exist, only 78 possess literature. Therefore, "[...] hundreds of active languages are never written: no one has created an effective way to write them. The fundamental orality of language is constant" (Ong, 1998, p. 15). However, in order to discuss the recording of languages in writing, one must go back to ancient times. At a time when computers and digital writing were still novel, Chartier (1998) drew attention to the fact that the screen reader resembles the reader of Antiquity:

> The text he reads runs before his eyes; of course, it does not flow like the text of a scroll book, which had to be unrolled horizontally, since it now runs vertically. On the one hand, he is like the medieval reader or the reader of the printed book, who can use references such as pagination, indexing, and textual segmentation. He is simultaneously both of these readers. At the same time, he is freer. Electronic text allows him greater distance in relation to writing. In this sense, the screen appears as the endpoint of the movement that separated text from the body. The reader of the codex-form book places it before him on a table, turns its pages, or holds it when the format is smaller and fits in the hands (Chartier, 1998, p. 13).

What Chartier (1998) did not anticipate is that pagination is now progressively falling into disuse. How many doctoral dissertations do we read that omit page numbers, given that reading will occur in digital format? In any case, the fact emphasized here concerns the bodily distancing between author and text, and between reader and text, when writing and reading occur on screens. This is a bodily transformation, and written culture is — as the scholar states — inseparable from its gestures. More than that, screen-based writing leads the author to partially constitute themselves also as the editor of the work, allowing text production and editing to become contemporaneous processes (Chartier, 1998). In addition, in electronic text, the reader may, strictly speaking, intervene in the very construction of the writing.

> The new textual medium allows uses, handling, and reader interventions infinitely more numerous and freer than any of the older forms of the book. In the scroll book, as in the codex, the reader can certainly intervene. It is always possible to insert writing into blank spaces, but a clear division remains — both in the ancient scroll and in the medieval and modern codex — between textual authority, provided by the manuscript copy or typographic composition,

> and reader interventions, necessarily indicated in the margins, as a peripheral space in relation to authority. It is well known that this is no longer true. The reader is no longer constrained to intervene in the margin, in either the literal or figurative sense. The reader can intervene at the heart, at the center. What remains, then, of the definition of the sacred, which presupposed an authority imposing an attitude composed of reverence, obedience, or meditation, when the material medium blurs the distinction between author and reader, between authority and appropriation? (Chartier, 1998, p. 91).

The historical inscription of digital text has therefore produced a transformation in forms of writing and also in forms of reading. This corresponds to what Chartier (1998) characterizes as the third revolution of reading. Reading on a screen is not reading a scroll. Nor is it reading a codex. Research, in turn, will no longer rely on the physical contiguity of documentation. Objects of study become literally virtual and are governed by database organization. They are electronic catalogs, repertories, and keywords "[...] that make access to information possible" (Cavallo; Chartier, 1998, p. 30). Therefore — Chartier (1998) concludes — an entire system of organization and access to texts is redesigned: "By reading on a screen, today's reader — and even more so tomorrow's — once again finds something of the posture of the reader of Antiquity, who read a *volumen*, a scroll" (Cavallo; Chartier, 1998, p. 30). There is therefore, as already observed, a simultaneity of two logics, configuring, however, a "[...] totally original and unprecedented relationship with the text" (Cavallo; Chartier, 1998, p. 30). The economy of writing makes possible a simultaneous and parallel action of production, transmission, and reading of the same work. This also implies simultaneity in text editing and distribution. It is as if the writer became the editor and the reader became a co-author of the work.

In the Middle Ages, the challenges of reading were entirely different:

> Medieval students read in a completely different way from students today. The eyes of a modern student move across legible, white, and well-printed pages or across the clear screen of a computer with a fluency that is at once common and extraordinary, surpassing even the fluency of spoken language. The medieval student, by contrast, who almost always read only in Latin — for many an uncomfortable language at best — faced arduous work before the text. Each word had to be separated one by one, often recognized only after being pronounced aloud (Fischer, 2006, p. 163).

During the Middle Ages, decisive transformations occurred in modes of reading.

> Between the 4th and 5th centuries, the transition took place from the papyrus scroll to the codex, in which sheets were folded and sewn into page form; in the 8th century, the separation of words facilitated a practice that had

> previously been quite rare: silent reading. Also medieval innovations were the organization of text into chapters, paragraph marking, indexes, punctuation, page numbering, and revision, constituting a process of systematic classification of texts. Such operations generated differentiated ways of reading and commenting on texts, within study methods that would come to characterize exegesis (Boto, 2000, p. 51).

The first major revolution of written culture was — it may be said — the transition from the papyrus scroll to the codex. Cavallo (1998) states that the codex corresponds to the notebook-style book, with pages (Cavallo, 1998, p. 90). On this subject, the author argues that the codex was easier to produce, shortening production time and facilitating book circulation. It is a practical format. Writing occurs on both sides of the page, representing cost savings. However, the codex also allows more fluid reading because the bodily posture of the reader is modified. The book adheres to the person. For this reason, the scroll format gradually loses ground until the codex becomes dominant. Progressively, the book becomes a marker of social differentiation: "[...] large monumental copies produced for the powerful, smaller formats for readers and of lower quality" (Barbier, 2018, p. 88).

The second major transformation affecting reading practices — according to Chartier (1998) — is technical: "[...] it revolutionizes, in the mid-15th century, the modes of text reproduction and book production. With movable type and the printing press, manuscript copying is no longer the only available resource to ensure the multiplication and circulation of texts" (Cavallo; Chartier, 1998, p. 26). Even before that, however, other changes occurred, such as the emergence of silent reading, facilitated once words in text were separated in the 8th century. Manguel (1997) refers to the fact that, in the 5th century, Saint Augustine described Ambrose as an extraordinary reader: "When he read, his eyes scanned the page and his heart sought the meaning, but his voice was silent and his tongue still" (Saint Augustine *apud* Manguel, 1997, p. 58). Anselm, according to Augustine, as reported by Manguel (1997), never read aloud.

Even so, Cavallo and Chartier (1998) point out that silent reading was initially a practice restricted to monastic writing environments. The scholastic model of writing and reading would confront this tradition, and by the 14th and 15th centuries, silent reading had become "[...] a common practice among lay aristocracies and the learned" (Cavallo; Chartier, 1998, p. 27). Manguel (1997), in turn, observes that "[...] the first regulations requiring scribes to remain silent in convent *scriptoria* date from the 9th century" (Manguel, 1997, p. 67). Until that time, they worked by dictating or even

reading aloud to themselves in order to facilitate understanding of the text they were copying.

The practice of silent reading should also be recorded because:

> Reading only with the eyes and writing without dictation isolated individual thought from group sanctions and encouraged the type of environment in which the new university and the lay heresies of the 13th and 14th centuries developed (Saenger, 1998, p. 162).

With silent reading, students could compare the words of their teachers with what was written in books. The fact is that, by the end of the 13th century, silent reading became a practice required by libraries themselves. It came to be considered that readers who read aloud disturbed their neighbors: “[...] when readers began to read visually, noise became disruptive” (Saenger, 1998, p. 161).

2 Reading practices before and after the digital era

To understand the historical dimension of digital production, it is necessary to establish the impact that this change, inscribed on the screens of the virtual world, has represented in the hearts and minds of generations shaped within the physically literate culture of the codex model. As Chartier (2023, pp. 66–67) stated:

> The emergence and diffusion of the codex between the 2nd and 4th centuries was a fundamental morphological revolution that engendered a new form of book, distinct from the scrolls of the ancients, although it did not transform the technique of text reproduction which, until Gutenberg, was manuscript copying.

Chartier (2023) considers — as previously noted — that the impact of the codex is therefore more decisive in modifying reading practices, with respect to the intellectual operations involved in them, than the innovation of print culture itself. The handwritten codex and, later, the print culture derived from it are governed by a logic that is spatial, topographical, and cartographic. On this matter, Chartier (2023) states: “The pages of a book or a journal, the shelves of a library, the spaces of a bookstore are territories traversed by the reader. He (or she) is a traveler, a pilgrim, a poacher” (Chartier, 2023, p. 69). Writing and reading practices have, over time, gone through several stages:

> [...] the separation of words, practiced in Northern France beginning in the 11th century; the codified use of punctuation marks clearly distinct from one

> another; the introduction of capital letters to indicate the beginning of sentences; and the use of multiple diacritical marks (Barbier, 2018, p. 323).

Eisenstein (1998) highlights that, regarding innovations in writing and reading across different historical periods, the printing press would deserve first place among the innovations of the Renaissance. This is because:

> The leap from manuscript to print not only generated a set of transformations (as opposed to the idea of a 'transitional period'), but involved a transformation that covered all of Europe and occurred over a relatively short period of time. Within a few decades, printing workshops were established in urban centers throughout the continent. Around 1500, several effects resulting from the circulation of printed materials were already evident… During the second half of the 15th century, we observe the same types of new workshops producing books in nearly all Western European languages in major urban centers. New occupations were created, such as compositor and type founder: techniques traditionally developed by metalworkers, merchants, and scholars were directed toward new purposes. New professional groups, in all regions, were mobilized by lay entrepreneurs seeking to open new markets, expand commercial networks, and display their products at annual book fairs. Around 1500, we can safely say that the era of scribes had ended and the age of printers had begun (Eisenstein, 1998, pp. 132–133).

Eisenstein also notes that, due to the predominance of rural populations in early modern Europe, "[...] as well as the persistence of local dialects, which imposed an additional linguistic barrier between the spoken and written worlds" (Eisenstein, 1998, p. 47), changes related to book use were initially slower. Conversely, in cities, where merchants were involved in book trade, there existed a broad circuit of literate individuals. The reading public ranged from those literate only in the vernacular to those who also read Latin. The fact is that printing popularized literacy and literate culture. Eisenstein (1998) states that, with printing, not only did reading literacy increase; learning through reading increased substantially. Gifted students could learn efficiently through independent reading of books, sometimes even dispensing with the need for a teacher, achieving "[...] mastery on their own, even when they had to obtain certain books surreptitiously, hidden from their teachers" (Eisenstein, 1998, p. 50).

As Gilmont (1999) notes, in the 16th century, what is unusual is that reading and books multiplied within a context in which relationships were fundamentally oral. It was an illiterate society; yet written texts occupied space within it. At the same time, it was a literate society because knowledge of letters already circulated widely: "Alongside the silent gesture in which contact occurs in intimacy between a text and its reader, other forms of access to writing continued to be practiced" (Gilmont, 1999, p. 59); whether silent reading, oralized reading in more intimate circles, or religious

readings in the liturgical model, which, during the Reformation, became common practice among both reformers and Catholics. However, the author reminds us: “The assimilation of the text by the reader is an eminently personal work of selection and restructuring of written data” (Gilmont, 1999, p. 59).

In a certain sense, reading leads to a paradox: within it, the writer withdraws.

> The primordial relationship between writer and reader presents a marvelous paradox: by creating the role of the reader, the writer also decrees the death of the writer, for, in order for a text to be complete, the writer must withdraw, must cease to exist. As long as the writer is present, the text remains incomplete. Only when the writer abandons the text does it gain existence. At that point, the existence of the text is silent, silent until the moment when the reader reads it. Only when capable eyes make contact with the marks on the tablet does the text gain active life. All writing depends on the generosity of the reader (Manguel, 1997, p. 207).

Chartier (1999), when analyzing the readings of Menocchio, the Friulian miller so thoroughly investigated by Ginzburg (2006), demonstrates that the originality of his reading practices did not derive from what he read, but from how he appropriated the texts he read. In this sense, his concept of appropriation became a foundational reference for studies in the history of reading. Reading performs an interpretive function that adds elements to the text. Reading therefore positions itself in relation to the text in a dialogical posture, as it confers upon textual signs a horizon of expectations,

> [...] collectively shared, which governs their reception. The meaning of the text, or rather, the *meanings*, thus depend on classification criteria, reference *corpora*, and interpretive categories that belong to its different audiences, successive or contemporaneous (Chartier, 1999, p. 123).

Carlo Ginzburg (2006), when studying the trial of the miller Menocchio in *The Cheese and the Worms*, fundamentally discusses Menocchio’s ways of reading. As important as what the miller read was how he read and appropriated the content of his reading. Menocchio established “[...] a filter that emphasized certain passages while concealing others, that exaggerated the meaning of a word by isolating it from context, that acted upon Menocchio’s memory” (Ginzburg, 2006, p. 72) and distorted his reading, referring directly not to the printed page but to oral culture. Menocchio stated that he had not spoken with anyone about his readings, “[...] nor have I ever had companions in my opinions” (Ginzburg, 2006, p. 83), which he claimed came from his own mind (Ginzburg, 2006, p. 57). He said that his worldview had been shaped by the

books he read, some of which were his own and others borrowed (Ginzburg, 2006, p. 68).

In the preface to the Italian edition of *The Cheese and the Worms*, Ginzburg (2006) points out that the invention of the printing press and the occurrence of the Reformation concretely enabled Menocchio's cultural practices, since "[...] the gigantic ruptures determined by the end of the literati's monopoly over written culture and the clergy's monopoly over religious matters had created a new, potentially explosive situation" (Ginzburg, 2006, p. 25). There would therefore be inventive and creative capacity in the act of reading. More than that, "[...] the same text, fixed in its letter, is not the 'same' if the devices of the medium that transmit it to readers, listeners, or spectators change" (Chartier, 1999, p. 123). Indeed,

> The discrepancy between the texts read by Menocchio and the way he assimilated them and reported them to the inquisitors indicates that his positions cannot be reduced or traced back to one or another book. On the one hand, they belong to a very ancient oral tradition; on the other, they evoke a series of motifs developed by heretical groups of humanist formation: tolerance, a tendency to reduce religion to morality, etc. This is only an apparent dichotomy, which in fact refers to a unitary culture in which clear divisions cannot be established. Even if Menocchio came into contact, more or less indirectly, with learned environments, his statements in defense of religious tolerance and his desire for radical social renewal present an original tone and do not appear to be the result of passively received external influences. The roots of his statements and desires are planted far away, in an obscure, almost indecipherable stratum of remote peasant traditions (Ginzburg, 2006, p. 23).

The fact is that all people, all generations, can only read through the intellectual technologies prevailing in their time. Menocchio was a boundary case, impacted by the circulation of printed material to which he had access. Evidently, when there are changes in the intellectual technologies of literate cultural production, practices begin to coexist. Codex culture, for example, did not immediately eliminate scroll culture. Print culture does not eliminate handwriting [...] These are distinct media associated with different uses and modes of writing. It is important to keep this in mind when approaching the history of writing and reading. The medium that presents the text is fundamental to its existence as a text — as Chartier (1998) already noted. Indeed, there exists a horizon of expectations and reading protocols that shape reading practices, each in its own way. A text cannot be understood independently of the form through which it reaches its reader. On this subject, Carr (2011, p. 95) also reflects on reading style when faced with a printed page:

> What was so remarkable about book reading was that deep concentration was combined with highly active and efficient decoding of text and interpretation of meaning. Reading a sequence of printed pages was valuable not only for the knowledge readers acquired from the author's words, but also for the way those words awakened intellectual vibrations within their minds. In the silent spaces opened by prolonged, distraction-free reading of a book, people created their own associations, made their own inferences and analogies, and cultivated their own ideas. They thought deeply while reading deeply.

3 Medieval universities and their contribution to a history of reading

The growing demand for texts, however, predates the printing press. It can be said that the *pecia* system of medieval universities introduced new protocols and requirements for reading. There was a university committee that controlled the quality of the text, of the reference manuscript — which was called the exemplar — and it was then sent to a specialized bookseller. As Barbier (2008, p. 110) states:

> The exemplar is divided into quires, which are in turn entrusted, each to a student or a professional copyist, so that several copies can, in rotation, be produced simultaneously by several scribes. There would therefore be a reference text; and, derived from it, the *pecia* system (Barbier, 2018, p. 98).

It is perhaps worth reflecting on how medieval universities consolidated their structure and functioning, as well as on the legacies we have inherited from this trajectory, because it relates to historically constituted ways of teaching reading and writing practices. Above all, the word university is closely linked to the notion of guild corporations. Medieval guilds were associations that enabled the practice of different urban professions and established criteria for authorization to enter that specific branch of the labor market. Guilds were organized into professional categories divided into masters, journeymen, and apprentices, where the first were those who had full mastery of the profession and the latter were those still learning. Universities were constituted within the urban space as a corporation structured around the written word.

Universities thus emerged as craft corporations arising from the municipal schools that, from the eleventh century onward, organized themselves within the boroughs. One may therefore say that the universities that emerged in the twelfth century and consolidated across thirteenth-century Europe were urban groupings: guild-like corporations whose very material — whose object — was literate knowledge. Two universities were founded and contended for primacy as the "first." The University of Paris was formed from a corporation of masters and received very young students, beginning at age fourteen, which corresponded to the population that, at the time,

attended municipal schools. The University of Bologna, by contrast, was created as a corporation of students, in defense of their interests. Bologna's students were older — between eighteen and twenty-five years of age — and it was from the student body that the university's governing officers were elected, including its Dean.

It should be noted that universities emerged under the banner of autonomy. This involved pedagogical, administrative, and financial autonomy. No one, not even the clergy, was authorized to dictate what a university professor ought to teach. Professors possessed what came to be called freedom of the chair. Universities were established sometimes spontaneously, as in the cases of Paris and Bologna; sometimes through migration, as in the case of the University of Cambridge, constituted as a dissidence from the University of Oxford; and sometimes through papal or royal intervention, as in the cases of the Universities of Salamanca and Coimbra.

Fundamentally oriented toward common study and debate — the class was composed of lectio, quaestio, and disputatio — the university appears as a consequence of the development of municipal schools, new didactic methods, the expansion of knowledge through increased translation of Greek works, and, finally, the new urban-commercial configuration acquired by society in that period. In this regard, Le Goff (1973, p. 73) underscores: "The thirteenth century is the century of universities because it is the century of corporations." The lectio, or lesson, was the moment when the professor read the text and dictated it to students. This practice was necessary because books, still manuscript at the beginning of the thirteenth century, were very expensive. Moreover, the professor's exposition itself — the lectio — became the content to be discussed later in class. Next, the instructor posed problematizations related to the theme developed; This was the quaestio, followed by the phase known as disputatio. The disputatio was the debate around the intellectual problem posed by the master. There is no university where there is no intellectual problem to be resolved. This was the classroom method of the newly created universities.

Beyond establishing a public function for thought—with the emergence of the occupation of university professor, which inaugurates, according to Le Goff (1973), the very sense of "intellectual"—universities also delineated a new status for the teaching profession: a vocation that, from then on, would enjoy heightened reputation insofar as it approached the ministry of the priesthood. Attracting masters and students from the

most varied regions, universities quickly became centers of study in which the healthy breath of debate, discussion, and critique made them radiating hubs of culture, ideas, and even a new form of academic sociability then coming into being. By sharing the knowledge produced and contributing to its dissemination, professors and students became, within this associative spirit, subject to a new code whose laws were autonomously established within the internal context of the university corporation:

> In the cities where they are formed, universities, by the number and quality of their members, manifest a force that unsettles other powers. It is in struggle, sometimes against ecclesiastical powers and sometimes against secular powers, that they manage to conquer their autonomy (Le Goff, 1973, pp. 73–74).

As Le Goff (1973) reports, citing the Dominican Thomas of Ireland, the city of Paris in the thirteenth century was divided into three parts:

> [...] that of merchants, artisans, and the people, which they call the great city; another, that of the noblemen, where the king's court and the cathedral church are located, which they call the *cité*; and the third, that of students and colleges, which they call the university (Thomas of Ireland *apud* Le Goff, 1973, p. 81).

Thus, the new institution opened the way, still in the thirteenth century, for a new model of master and thinker. The function of teaching was compared to the art of preaching—magisterium and priesthood. It is as if the university intellectual competed, in the public arena, with the village parish priest. What knowledge was taught? The so-called Seven Liberal Arts, composed of the *Trivium*—Grammar, Rhetoric, and Dialectic—and the *Quadrivium*—Arithmetic, Geometry, Astronomy, and Music. The *Trivium* was the set most commonly taught in the faculty that initiated all studies: the Faculty of Arts, from which the other university courses branched—Law, Medicine, and Theology. Studies indicate a strong prevalence of young people from noble strata, especially in Law. Theology and even Medicine, by contrast, included many members of the middle strata of society. In Fischer's words (2006, p. 163):

> Fluent reading was the hallmark of professional quality. A *magister* could, without difficulty, "read rapidly" most texts in his field after investing many years of relentless effort to attain such skill. However, if that master changed sectors—from theology to jurisprudence, for example—his eyes would suddenly be paralyzed. This was because each area had its own Latin vocabulary, rhetoric, structure, abbreviations, and special symbols, which required years to learn and master. The Middle Ages were the great era of specialization, with professionals immersed in their field of activity. For this reason, most readers lived secluded lives, and it was rare for them to delve deeply into unfamiliar areas—much like most modern academics. These

> reading difficulties, even within a single field, demanded sustained effort from readers. Few people today are aware of the extraordinarily long time required by medieval university education. It far exceeded the four years of undergraduate study, the three of a master's, or the four of a doctorate today. At the Sorbonne, in Paris, in the twelfth century, for example, theology students were generally between twenty-four and thirty-five years old. And the prestigious degree of Doctor of Theology was granted only to those already approaching forty.

Universities also entailed—one might say—specific systems for classifying knowledge. With the advent of the modern era, printing, urban concentration, and even the emergence of colleges, new cleavages would arise for organizing accumulated knowledge. With Humanism, the notion of the universal person prevails — by definition connected to general knowledge. This Renaissance ideal survives into the seventeenth and eighteenth centuries and implied knowledge of everything, or at least knowledge of something about all things (Burke, 2003). This worldview led various fields of knowledge to branch and acquire their own identities. Such methodical classification of branches and subjects of knowledge would become sharply marked in the eighteenth century, with the clear emergence of precise disciplinary boundaries.

> To speak of 'disciplines' in the plural risks projecting the disciplinary conflicts of a later era onto the beginning of the modern period. Scientific disciplines in particular have been considered an invention of the late eighteenth and early nineteenth centuries. Anachronism is a constant danger. But there is also the opposite danger: distinguishing too abruptly—such as in debates over "professionalization"—between the early modern period and later modernity. What was new around 1800 was not so much the idea of a discipline as its institutionalization in the form of academic "departments" (a term first used in English in 1832, according to the *Oxford English Dictionary*). Even these departments were less a wholly new invention than an elaboration of what the medieval university called "faculties," a flexible term referring at once to a capacity, a branch of knowledge, and a corporate group (Burke, 2003, pp. 86–87).

4 Colleges, classrooms, and the impact of digital culture

Between the thirteenth and fourteenth centuries, the term college referred to an asylum for poor students, maintained near universities by religious orders. University students arriving from elsewhere lodged in accommodations (maintained by the clergy) intended to provide food and housing. At first, colleges were not teaching institutions; rather, they regulated a disciplinary order that allocated times for rising, sleeping, and eating. It was at the beginning of the fifteenth century that these institutions began to acquire a formative character: "[...] they are organized through a rigorous disciplinary system, absolutely distinct from their medieval antecedents — and

characterized by the explicit proposal to combine instruction and moralization” (Boto, 2017, p. 64). Over time, colleges came to constitute largely autonomous cells, formed by an elite of students: humanists preferred to go there to teach, "[...] since it offered them an environment that corresponded much better than the old faculties to their pedagogical conceptions" (Verger, 1990, p. 286).

Nóvoa (1987) argued that the modern school model emerged in two stages: first, between the sixteenth and seventeenth centuries, it took shape as a method, through the organization of didactic procedures to be used in teaching; then, from the late eighteenth century onward, the same model acquired political contours, projecting schooling as formation for citizenship. The method designed at the outset of the Early Modern period did not immediately spread. It existed first in religious colleges and would only be disseminated to all schools at the end of the nineteenth century. Modern schooling, from its inception, in any case, aimed to instruct and civilize. It is a school that partitions knowledge sequentially and hierarchically, dividing instructional time into schedules. In this way, a different temporality was established. School space is distributed by classes; school time is fixed by timetables — and classrooms are composed of students of similar age and comparable levels of knowledge: “Schooling, through such devices, orchestrates an entire ritual of existence, establishing a way of being that is specifically scholastic” (Boto, 2017, p. 206).

The fact is that, since the modern period, the school has become one of the principal institutions to articulate discourses about reading. According to research conducted by Chartier and Hébrard (1995), in Discourses on Reading (1880–1980), it is possible to state that school reading has always entailed specific ways through which reading practices acquire a distinctly scholastic tone. Above all, in school, the goal was to read “good texts,” selected excerpts, texts that pointed first to social coexistence through the codification of norms of civility, but that also signaled commitment to the nation-state. To learn to read through school means becoming capable of reading the great works—acquiring a general culture whose purpose is to enable the student to handle the repertoire of literate culture (Chartier; Hébrard, 1995). To reach such erudite knowledge, however, foundational exercises were required: reading, explanation, and recitation (Chartier; Hébrard, 1995). Yet school reading has always been haunted by the anxiety of those who feared the potentially deleterious effects produced by improper readings. This fear of reading, according to Chartier and Hébrard (1995), was

only overcome in the 1970s, when the impact of television in family households came to overshadow concerns about the possible consequences of inadequate reading.

Returning to the logic of our account, it is unequivocal that, with the emergence of printing—unlike the university structure and the *pecia* system—a true technological revolution occurred, once again reforming reading practice, perhaps with no antecedent of comparable magnitude other than the transition from scroll to codex. On this point:

> Revisiting Pierre Lévy's thesis, we would argue that modes of knowing and ways of thinking are fundamentally shaped by technical media, and that new patterns in the format and multiplicative capacity of print affected structures of thought. Lévy understands the expression of human intelligence as requiring a historical account of the technologies that produced changes in human worldview. Accordingly, technical shifts point—on this author's view—to transformations in norms of knowledge, both in terms of the emergence of meanings attributed to the world and in terms of how those new meanings are communicated. In this direction, Lévy employs the expression "technologies of intelligence" to address what he understands as "cognitive ecologies" in their historical sense. From this perspective, one might speak of a transformation not only in modes of access to knowledge, but in knowledge itself — known knowledge — in the modes of thinking and formulating questions about reality. In this expanded sense, the principal markers of change with respect to writing would have been, according to specialists in the history of reading, precisely the transitions from scroll to codex (4th century), from manuscript to print (15th century), and from the printed book to the computer (20th century) (Boto, 2000, p. 52).

Considering, with Levy (1993), that intelligence technologies are historical and therefore provisional, it is possible to see that technical advancement has implications for the use of technological devices present in each of the stages that may be considered. Thus, the revolution that occurred in the transition from the scroll to the codex was even greater than the one that occurred in the transition from manuscript to print; it is comparable only to this revolution of our own time, which takes place between printed text in codex form and electronic text. These are different ways of operating technology. But they also change our gaze as researchers.

The fact is that the only technology that has effectively been able to compete with print culture is computing. Prior to digital culture, there were, of course, other technological resources that challenged the culture of the printed book. Yet these resources operated in a different key; they were not counterparts of sufficient stature to confront editorial production. Did books lose prestige with the advent of radio, cinema, and television? Yes—but none of these media proved capable of producing alternative ways of being a book. With digital culture, this reality is substantively

altered. New information technologies—technologies of intelligence, as Pierre Lévy (1993) would call them—call into question the very existence of print. They are contrasting modes of representation, as Bolter (1998) argues.

Digital culture—as an information technology—has reshaped the domain of work, since, with virtual environments, physical presence at the workplace becomes more flexible. This is a technological advance consistent with a globalized society that progressively increases "[…] the knowledge and cultural contact among the planet's different cultures and social groups" (Moreira, 2016, p. 69, our translation). Digital intervention in every sphere of social life is a reality that was already clearly in place at the beginning of the twenty-first century.

From the standpoint of teaching, the impact of digital culture is no less significant. How can we draw on internet resources to transform our pedagogical practices? More than ever, it falls to the teacher to serve as a mediator between students and access to knowledge. Yet, at present, what we see in our classrooms are students reading, on a phone screen, the texts assigned for class. Does a text read on a phone have the same effect on the reading brain as a text read physically, even if only on a photocopy?

It can be said that, today, reading is a rapid and light practice. In that speed, it lacks deep comprehension. This is what Carr (2011) tells us in the book *"The Shallows: What the Internet Is Doing to Our Brains,"* from 2011. In that work, the author is unequivocal in his critique of the superficiality of reading in the era of digital culture:

> The irony of Google's efforts to make reading more efficient is that they undermine a very different kind of efficiency that book technology brought to reading—and to our minds—in the first place. By freeing us from the struggle to decode text, the form writing assumed on a page of parchment or paper allowed us to become deep readers, turning our attention and mental power to interpreting meaning. With writing on a screen, we can still decode text rapidly—we read, if we read at all, faster than ever—but we are no longer drawn into a personally constructed, deep understanding of a text's connotations. Instead, we are rushed onward to another related piece of information, and another, and another. The shallow extraction of "relevant content" replaces the slow excavation of meaning (Carr, 2011, p. 227).

For Carr (2011), the literate brain was fundamentally a literary brain:

> Reading a book was a meditative act, but it did not involve emptying the mind. It involved filling—or refilling—the mind. Readers withdrew their attention from the external stream of passing stimuli in order to connect more deeply with an internal stream of words, ideas, and emotions. That was—and is—the essence of the unique mental process of deep reading. It was book technology

> that made possible this “strange anomaly” in our psychological history. The brain of a book reader was more than a literate brain. It was a literary brain (Carr, 2011, p. 96).

Newspaper reading, which had already declined with the advent of radio and television, fell even more sharply after the emergence of the internet. People visit websites. The physical newspaper is no longer read. Carr (2011, p. 133) argues that “[…] the web would become the primary channel for distributing news.” Even more striking has been readers’ stance toward the public library. Internet access is now the service most requested by library users: “The predominant sound of a modern library is keystrokes, not turning pages” (Carr, 2011, p. 139).

Carr (2011) turns to neuroscience to examine the ways in which recent intellectual technologies have contributed to shaping the human mind. That is, even considering people’s neural plasticity: “What does science say about the real effects that internet use is having on how our minds work?” (Carr, 2011, p. 161).

Online reading, the author continues, is careless reading, fostering

> [...] hurried, distracted thinking and shallow learning. It is possible to think deeply while surfing the internet, just as it is possible to think shallowly while reading a book, but it is not the kind of thinking that the technology encourages and rewards (Carr, 2011, p. 162).

Research in the mind sciences, Carr (2011) emphasizes, points to demonstrably different patterns of brain activity when reading a text in printed-book form as opposed, for example, to conducting a web search. This certainly affects learning. But it also affects the way research is conducted.

> The need to evaluate links and make related navigation decisions while processing an overwhelming amount of sensory stimuli requires constant mental coordination and decision-making, distracting the brain from the work of interpreting text or other information. Whenever we, as readers, encounter a link, we have to pause, at least for a fraction of a second, to allow our prefrontal cortex to evaluate whether to click or not. The redirection of our mental resources—from reading words to making judgments—may be imperceptible to us—our brain is fast—but it has been shown to impede comprehension and retention, particularly when repeated frequently. As the executive functions of the prefrontal cortex take the reins, our brain is not only exercised but overloaded. In a very real sense, the web makes us return to the time of *scriptura continua*, when reading was a cognitively exhausting act (Carr, 2011, p. 170).

In other words, online reading is more mentally fatiguing and allows for weaker apprehension of the content being read. Additionally, due to the fast-paced reading on the web, we are more likely to believe false information, known as fake news.

Reflecting on Carr's book, Pallares-Burke (2023) notes that it disclosed a complex reality: "So-called brain plasticity, which allows us to learn new things quickly, especially when we are young, is as much a disadvantage as it is an advantage" (Pallares-Burke, 2023, p. 41). Linear reading, once a skill people acquire permanently after mastering it, becomes a competence that is diminishing among younger generations because it is no longer practiced sufficiently.

Chartier (2023) argues that there is no equivalence between the logic that governs print culture and the logic that governs the digital world: "The first is spatial, topographical, cartographic. The pages of a book or a journal, the shelves of a library, the spaces of a bookstore are territories traversed by the reader" (Chartier, 2023, p. 69). The algorithmic logic of the digital world, by contrast, "[...] proceeds from a hierarchy of fields, themes, topics, rubrics, and keywords" (Chartier, 2023, p. 69). Chartier (2023) observes that searching on Amazon follows criteria quite different from those used when we sought books in libraries or bookstores. Today, the specialist notes, there is a total distancing from the book,

> […] not only as an object of written culture, but also as a form of discourse—as a textual architecture in which each element (a chapter, a paragraph, a sentence) occupies a particular place and plays a specific role in narration or argumentation (Chartier, 2023, p. 70).

Chartier (2023) also considers the diffusion of false news to be facilitated by this model of information technology:

> *Wreaders* or *digital natives* arrive at school with a great familiarity with the digital universe. Their textual practices are shaped by social media use. Their reading habits do not concern themselves with verifying the truth of the information and assertions they read. For them, and for many internet users, the guarantee of truth has shifted from critical examination of statements to blind trust in the vehicle of enunciation. Thus, digital technology, which makes it possible to share knowledge and learning, has become the most powerful instrument for the massive diffusion of the most absurd theories, false news, falsifications of reality, and manipulations of the past. What is at stake is the capacity of our societies to refuse the erosion of criteria of truth, the abandonment of critical judgment, and the fallacious rewritings of history. The all-digital is a seductive temptation. That is why it is indispensable to make its dangers known as well, when all relations with writings of any kind are shaped by impatient, credulous, and manipulated readings, as is often the case on social media. It is the bond that has existed since ancient Greece between reasoning and deliberation, between critical judgment and political decisions, between knowledge and citizenship, that is under threat (Chartier, 2023, p. 70).

Beyond the digital, however, one must ask how children learn to read. The fact is that—according to Maryanne Wolf (2024, p. 40)—"[…] a middle-class child hears around 32 million more words in their environment than a disadvantaged child." Research shows that contact with literate culture, even before the formal process of literacy, is decisive in shaping literacy practices. This affects not only the years of childhood, but the individual's entire school trajectory.

> Children who arrive at early childhood education after having heard and used thousands of words—whose meanings they already understand, classify, and store in their young brains—have an advantage in the playful field of education. Children who have never had a story read to them, who have never heard rhyming words, who have never imagined themselves fighting dragons or marrying a prince, face every possible adverse odds (Wolf, 2024, p. 40).

Maryanne Wolf (2019) also emphasizes that the domain of learning to read includes aspects of neuroscience, meaning that something new must be acquired. This is the case, for example, with the contrast between reading print and reading on screens.

> When confronted with something new that has to be learned, the brain not only reallocates its original components (that is, the structures and neurons responsible for essential functions such as vision and hearing), but it can also repurpose some groups of neurons in these same areas to meet the specific demands of the new function (Wolf, 2019, p. 27).

5 Final Considerations

As Peter Burke (2003, p. 161) aptly notes, in what he characterizes as a social history of knowledge, "the acquisition of knowledge depends not only on the possibility of access to repositories of information, but also on intelligence, assumptions, and individual practices."

Digital culture, unequivocally today, challenges the school and the world of research. Access to sources is now often virtual rather than a physical encounter with the document. What are the implications of research conducted in digital collections for the production of knowledge in the humanities?

Digital culture must, in any case, be considered in its intersection with print culture. What meanings do today's youth extract from texts? Does it make sense for schools to remain in the format in which they were designed in the nineteenth century? (Moreira, 2016). But if we are to change the style of schools due to the challenges of the digital world, what should we alter? And where should we head? Would the use of

platforms, as proposed by some public school networks in the country, be a solution to this impasse? We believe not; especially because resolving this dilemma about the procedures to be taken due to the paradigm shift must be shared with teachers, who have professional teaching knowledge and accumulated reflection on their own teaching practice. Yet the question—where should we go from here?—persists as a prompt for meditation on the challenges posed by our present time to education. For this reason, we understand that, from the standpoint of research, digital culture has already been incorporated. It now falls to new generations of teachers to rethink classroom practices in dialogue with the digital. This will entail paradigm shifts: new ways of thinking and other ways of seeing.

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