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DESIGN OF ON-SCREEN READING EXPERIENCES BASED ON A CHARACTERISATION OF TECHNOLOGICAL MEDIATION

DISEÑO DE EXPERIENCIAS DE LECTURA EN PANTALLA A PARTIR DE UNA CARACTERIZACIÓN DE LA MEDIACIÓN TECNOLÓGICA

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Abstract

This study was carried out in a context in which there is a low presence of digital reading devices, starting from the premise that the use of electronic reading devices implies an instrumental relationship with a technical object that can be characterized as a mediation relationship. The thematic analysis of documented narratives, reading tests and interviews with an intentional sample of readers and editors, were used in the framework of this research, the objective was to explore the pertinence of characterizing the mediation relationships that readers of literature texts on screen establish with electronic devices through their experience. The findings indicate the need to lend support to the reader; this characterization is an important requirement

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for designing reading experiences. As a result, the mediation relations that readers establish with electronic devices are, in principle, in the first contact, of alterity. The readers observe the device as an otherness, an object with a certain autonomy, capable of arousing admiration.

Keywords

Cognition; Reading experiences; Mediation relationships; Screen Reading; Scaffold learning.

Resumen

Este estudio se realizó en un contexto en el que hay una baja presencia de dispositivos de lectura digital, partiendo de la premisa de que el uso de dispositivos de lectura electrónica implica una relación instrumental con un objeto técnico que puede caracterizarse como una relación de mediación. En el marco de esta investigación se utilizó el análisis temático de narraciones documentadas, pruebas de lectura y entrevistas con una muestra intencional de lectores y editores, con el objetivo de explorar la pertinencia de caracterizar las relaciones de mediación que los lectores de textos de literatura en pantalla establecen con los dispositivos electrónicos a través de su experiencia. Las conclusiones indican la necesidad de prestar apoyo al lector; esta caracterización es un requisito importante para diseñar experiencias de lectura. Por consiguiente, las relaciones de mediación que los lectores establecen con los dispositivos electrónicos son, en principio, en el primer contacto, de alteridad. Los lectores observan el dispositivo como una alteridad, un objeto con cierta autonomía, capaz de suscitar admiración.

Palabras clave

Cognición; Experiencias de lectura; Relaciones de mediación; Lectura de pantalla; Aprendizaje de andamiaje.

INTRODUCTION

The article is part of the findings in the research “From printed text to digital text in literary works in the public domain: remediation for the scaffolding of on-screen reading experiences”. It must be said that studies on reading are traditionally carried out under the tutelage of psychologists or pedagogues, if not historians or professionals other than the discipline of design. A look at reading as an experience from the point of view of design seeks to focus attention on instrumental mediation and the materiality of the reading process.

In literature, it is found that reading is considered an instrumental and symbolically mediated experience, and it is in this mediation that electronic reading devices intervene in this digital time. This analysis focuses on the pertinence of characterizing the mediation relationships that readers of on-screen literary texts establish with electronic devices through their individual experience.

Reading not only involves cognitive skills, it also includes cultural practices that make it a historical product, which has changed over time. For example, the experience of reading on screen was made possible by conditions of technological development that refer to the practices of pre-cinema and cinema. In recent times, there have been changes deriving, among other things, from the creation of new screen supports, the transformation of formats and the wide availability of computer programs.

According to Huhtamo (2014), screens must be studied within the system to which they belong. When it comes to reading, the system that corresponds to it is that of the small screens of devices that in some cases have been conceived exclusively for reading, such as e-readers, and in others, they are part of equipment that supports multi-functional operating systems, whether tablets or computers, including mobile phones. All these types of screens are integrated to the visualization of graphic-textual information, in which the alphabetic reading is a permanent exercise. Such devices make up a system of screens with reading function.

At the current point of development of consumer electronics, the evolution of devices that can be oriented to reading texts is divided into two: electronic ink and LED display screens. The characteristic of the former is that they are almost exclusively devices oriented towards reading, and specifically to the linear reading on screens that have only recently begun to integrate colour and that emulate the legibility conditions of printed paper, with a correlative lack of fluidity to advance the pages and the current impossibility of handling dynamic formats of interactive texts; while the latter have the function of serving as a platform for running multiple applications, in which reading is only a fraction of their usage profile, but which manage to exploit their ability to visualize dynamic text and video to serve as support for interactive animated book formats.

If this recent reading ecosystem is then considered, it must be useful to establish the mediation relationships that exist with electronic reading media, as part of a quest that leads to better reading experiences.

The relationship between the individual and the technology involved in the on-screen reading process has been observed in this research from the post-phenomenological approach of Don Ihde (1990), assuming that it is about mediation relationships between the individual and technology. In Ihde's own terms, this classification arises from a reflection on what he calls the ambiguity of technical objects. In his work *Technology and the lifeworld*, Don Ihde (1990) exposes that trait he considers inherent to technique. He says, for example, that some as a piece of art can interpret a flint engraving on a table by others as a paperweight, while an anthropologist would make a specific classification of the lithic tool. In this sense, he affirms:

The designer's intentions play only a small part of the later history of the artefact. (...) On a deeper level, this multiplicity of uses reveals a phenomenological clue from which to follow" (...) There is no thing in itself. There are only things in contexts and contexts are multiple" (...) A technological object, whatever it is, becomes what it "is" through its uses (p. 69).

In short, it is a question of accepting the relativity of human technology. Thus, the ambiguity of technical objects leads him to consider that one of the tasks of the phenomenology of technique is to establish relationships with technical objects, the way in which technologies are internalized by the extent that one interacts with them. This point of interest leads to the recognition of the diverse relationships established with the technical object that may be of interest for the experience itself and for the design of the devices. Recovering the interest in reading in the current era has the implication of looking back at the variety of digital media that has been created from advances in electronics and the extension of consumer electronics.

MATERIALS AND METHODS

The paradigm of this research is qualitative. It makes use of a phenomenological approach in the collection of information. In addition, it relied on a broad documentary and theoretical base referring to studies in communication, the history of reading and the technical knowledge involved in understanding electronic devices.

For the research, an "experiential field" was designed from the following instruments: verbal narrations of university students about their reading experiences, narrative documentation about concrete reading experiences on screen, short reading tests on screen with subsequent application of questionnaire, semi-structured interviews with advanced readers, exploratory reading tests and auto-ethnographic data.

This information was transferred to electronic files in Atlas.ti. The analysis of technological objects technique was also used and applied to electronic readers.

What is interesting in this field is that phenomenology, when investigated by experience, validates the perception of the actors of the process analyzed, giving way to a greater range of instruments for collecting information.

On the other hand, this phenomenological vision gave unity to the research to the extent that it asks about how the experience is lived or perceived by the people who experience it. The phenomenological perspective opened the possibility of using information obtained from the reflections of the readers and the researcher himself. The unifying concept in this phenomenological perspective was experience.

Shedroff (2009) gives absolute value to experience: “Experiences are the foundation for all life events and form the core of what interactive media have to offer” (2009, p. 4). It establishes six components of experience: amplitude, intensity, duration, triggers, interaction and meaning. Among them, one of the most important is duration, since the experience cannot be prolonged indefinitely. At this point, we thought of designing two types of reading experiences for research. One brief and the other extensive. In the first, the reader was presented with a chronicle whose average reading time was 20 minutes. Thus, in the end, he was certain that he had completed the experience, and he proceeded to fill out a questionnaire. In the second, the device was given to him to use for two or three weeks, and he would write a story about his reading experience.

RESULTS

In the first instance it can be considered that there are two theoretical aspects on which the concept of experience was integrated in this study: the first takes up elements of Dewey’s pedagogy and the second of Nathhan Shedrof’s experiential design.

For Dewey, experience ends up merging with art. His approach resumes the tradition of Greek philosophy:

Experience, for the Greeks, means a reservoir of practical insight, a background of knowledge useful in conducting the affairs of life. Sensation and perception were their opportunity and they provided relevant materials, but they did not constitute it on their own. They generated experience when retention was added and when a common factor in the multitude of felt and perceived cases detached itself to become available in judgment and exertion. Thus understood, experience is exemplified in the discrimination and skill of the good carpenter, pilot, physician, captain-at-arms; experience is equivalent to art. Modern theory has quite properly extended the application of the term to cover many things that the Greeks would hardly have called “experience”, the bare having of aches and pains, or a play of colors before

the eyes. However, even those who hold this larger signification would admit, I suppose, that such “experiences” count only when they result in insight, or in an enjoyed perception, and that only thus do they define experience in its honorific sense. (Dewey, 1929, p. 354)

Dewey referred to experience based on the meaning given to it by the Greeks, highlighting in particular that experience implies sensation and perception, but does not constitute experience in itself. It requires the memory and intelligence of a common factor that can be used in judgment and effort, which are embodied in the discernment and capability of the one experienced. However, this concept has caught fire in many fields, and is applied liberally until any suffering is considered as an experience. Therefore, we must not lose sight of this initial sense that Dewey claims and that leads him to compare experience to art. It is along this path that the adoption of the concept must be taken care of and understood, in the way it is used, for example, in design, when speaking of the design of experiences.

We call experience that which has remembrance, which is lived in a complete way. In the largest sense, reading is an experience as real as life itself, so whatever is read is so similar to what is lived that there is no differences between the two experiences. The term has made a career in the subject of reading, it is more and more frequent to find the expression “experience of reading” to announce a progress or a new proposal in the field of reading. It is common to find expressions like this: “they offer a digital reading experience that uses photos, texts, animations and sounds” (Arcadia, 2014-06-18). Thus, a consensus seems to be expressed around the suitability of the term.

In pedagogical terminology, it is common to speak of reading processes or practices or other terms, however, thinking of reading as an experience may well be interesting as a way of better understanding this phenomenon. So, how can the concept of experience in the use of electronic devices be made operational? Phenomenology translates philosophical reflection about being into a question about being. It is about considering the human being in his condition of “being thrown into the world”, as Heidegger put it. We see ourselves then before a subject that is defined by its relations with the world, by its experience of life. The act of reading seen from the plane of phenomenology is an experience.

Ihde assumes the relationship between human beings and the world in terms of experience, an experience in which subject and object are interwoven, a relationship that can be mediated by the different types of relationships described above. The experience for Ihde is the interweaving of the mutual relations between human beings and the world. The instrumental mediation in the reading with the electronic devices comes to establish how the different types of relations of mediation are presented, raised from the post-phenomenology by Don Ihde.

The first type of relations that Ihde formulates is called realization relations, in which the perception is given with some mediation. It is expressed in this way:

[I–Technology] [World].

The technology is incorporated or incarnated, according to the preferred expression. Perception occurs through the technical object. It points out the need for two elements to concur in order for the technique to be realizable. On the one hand, the technique must be good enough for mediation to be achieved. For example, a lens must be translucent so that you can see through it. On the other hand, there must be a kind of learning to use it.

Expressions derived from the experiences of the participants support this point. For example, (C. Quintero, personal communication, September, 9, 2015): “My generation has in a computer the possibility of opening up in many aspects. When the tablets arrive and you don’t have to be connected to the light or handle a laptop”. It is also an expression of the technical object’s capacity for accomplishment, as evidenced by other appreciations (E.E. Gómez, personal communication, December, 26, 2016): “I advance quickly in reading, and its presentation in ink makes you feel the sensation of reading a book, with leaves and black ink printed on its pages. I really like the resolution it has, the letters are easily understood”.

The elements of the accomplishment relationship are present not only in the handling of the hardware and software interfaces of the reading devices, but also in the management of the formats, issues that imply a deployment of technical knowledge necessary for the relationship. In this case, the text, which is accessed in a way that would not be possible without the mediation of the device, acquires properties that are not possible in the analogous environment. This is an attractive aspect of the devices: the possibility of offering an enormous range of functions of access to the texts. All this depends on the suitability of the device and its use under the necessary technical knowledge. In the corpus of documents, there are expressions such as: “The Reader clearly simplifies and at the same time multiplies to infinity the possibilities of reading” (L.A. Ríos, personal communication, August, 31, 2016). In this sense, the devices must achieve a better hardware and software design, at the same time that the formats must be standardized and have greater interoperability, that is to say, that they can be executed in as many machines as possible.

The second type of relationships that Ihde proposes, he calls Hermeneutics. In them, mediation is not incorporated. He formulates it this way: [I] [World Technology]. The square brackets imply that there is a certain opacity or distance between the subject and the object. On the other hand, in accomplishment relations technology is transparent. It exemplifies this type of relationship with the case of the use of a thermometer to establish the temperature of an outdoor environment seen

from inside, where this thermal sensation is not directly experienced. Hermeneutics implies an interpretation within a technological context. This type of activity, he says, involves the use of modes of action and perception analogous to the process of reading, in that writing is a hermeneutic technique. But here, the present research observes that the phenomenon of reading is unfolded, because it no longer interacts with the physical space of the book, but with the reading interface that proposes hermeneutic codes to understand in which position of the text the reader is, how to access the configuration, how to extend or reduce the typography and other functions inherent to the visualization and management of the text. It is at this point where on-screen reading represents an estrangement from the traditional form of the book. At this point, the hermeneutic relationship poses a great challenge to the reader: to incorporate another code into textuality.

A narrative excerpt from one of the participants in long experience indicates that: With electronic devices, the traditional idea of space as a place occupied by a body was transformed; the book is not there physically, but it is there virtually, that is, the notion of materialized space is forgotten, and a notion of information space is passed on. There are no sheets, no covers, no sewing, no cloth, but it is the same information that is held in that physical format, so the non-existence of the physical book does not mean its disappearance, but the change of its understanding. (L.A. Ríos, personal communication, August, 31, 2016)

Simpler formulations in a similar sense added: “a text that does not become bulky, but attractive”. Likewise, other reflections said: “In the Tablet you have the same [as in the computer] in a tenderer version. I like the power of the finger in generating movements. The screen understands, the page runs. I think I will be fine, it is what I enjoy most about tablets, that they recognize the body. Due to the constant use of tactile devices, it is almost intuitive to touch the screen to change; however, the buttons are also comfortable to turn the pages”. “What I liked most about the Reader is the ease with which it can be turned on, because you don’t have to wait long, and it doesn’t use as much energy as other devices”. And another comment: “I think the issue of font sizes on pages is very versatile, you have to know how to organize them, as well as the direction of the screen, before you start reading to be able to connect to the device. This is a real advantage because it allows for a reading experience tailored to what I need. For example, I like the screen to allow me to read at least half the page of a document, so I arrange the size in short and flip the screen horizontally. The 7-inch size is also quite nice, it allows for easy grabbing of the device from the sides, and when you flip the screen horizontally, it’s also easy to move the buttons with the hand closest to you if you use them”.

The third type of relations, those of alterity, Ihde expresses them as relations “with” technology. Technology appears as a quasi-other. It is expressed in this way: [I] [Technology] [World]. The object acquires a certain fascination when interacting. It is the sensation of control, of fluidity in the materiality proper to the object that is perceived as another. This is frequently observed in the relationship with books, to which certain affection is professed in the recognition of that otherness that is something more than the letters that compose it. In electronic devices, this is associated with factors such as the admiration they arouse, the desire to protect them, to keep them safe from the contingencies of manipulation. It is clear, in this sense, what one of the participants

stated: “When someone treats a Tablet badly, I suffer”. Other expressions confirm this: “In the Tablet you have the same thing in a tenderer version. I like the power of the finger in generating movement. The screen understands, the page runs. I think it is what I enjoy most about tablets, that they recognize the body. I have been using this Tablet for three years. I continue and will continue to love books in physics, but giving the opportunity to this electronic reader gave me the opportunity to know another world of reading and see that when turning its pages there are also traces of story”.

The ereader case is a very important element for most users:

“On the other hand, it is a very beautiful detail to be able to have the ereader in a cover that reminds a cover of a book, to the way to open it I mean. Lifting a cover to see the screen is like lifting a cover to see the printed sheets. Therefore, the covers for the devices are also important because they define what kind of relationship I am having with him. If the sleeve opens like a book, it means that this is not only to protect the screen, a common piece of data, but also to integrate into design form what was lost in the physical format. On the other hand, an ereader only protected by the edges gives a feeling of fragility, that the screen can be broken and damaged, as well as the absence of a decent entrance to its contents, like a beautiful cover”. (L.A. Ríos, personal communication, August, 31, 2016)

In addition, a very notorious expression about the relationship of alterity established with the technical object is expressed in this pair of statements of other participants: “Kindle, painter of letters”. “The Kindle, I take care of it like a real book, I have a leather case for it”. (D. Ruiz, personal communication, September, 9, 2017)

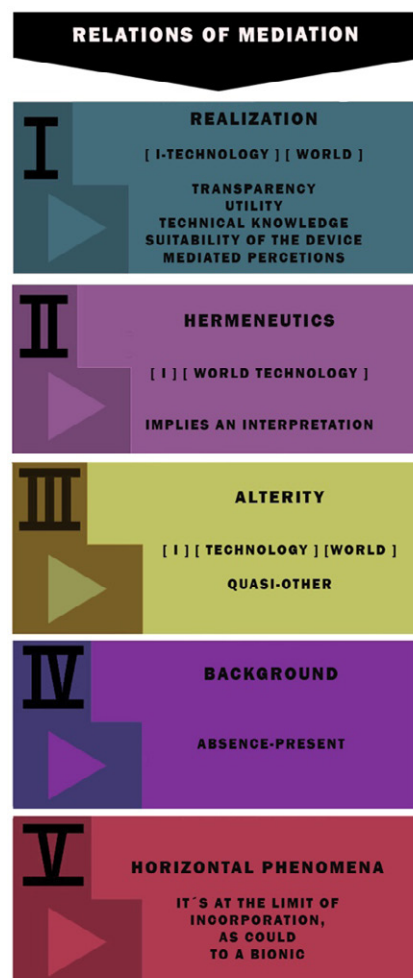
The relationship with technical objects is not exempt from sensations that after a while also become feelings, so that a friendly relationship is generated with the objects. This is what is clearly seen to happen with books, they awaken sensations and feelings that are not infrequently narrated in literature. This type of exaltation around electronic devices such as computers, tablets and e-readers is not so frequent, but they are already happening and hope fully they will start to proliferate once enough time has passed. Expressions such as “my tablet”, “the tablet understands”, expressed by the users in the investigation, indicate a proximity and appropriation of the technical object that can well be included within the relations of otherness. To close, a very clear example: “Now that I have had the opportunity to read in a reader, I think that, although books are still irreplaceable, this device is excellent for reading. So far, I have read four books in it. I advance quickly in reading, and its presentation in ink makes you feel the sensation of reading a book, with leaves and black ink embodied in its pages. I really like the resolution it has, the letters are easily understood. The impressions that I have had have been very pleasant, at times, I forget that it is a technological device and I feel that I am reading a book. On several occasions I have taught the e-reader to my family and friends, they also had no knowledge of what a e-reader is and what it is for. They have marveled at the similarity it has with the pages and ink of a book, once one of them told me that, if you put the page into the device because it was so similar to the pages of books”.

The fourth type of relationships, the background ones, exhibit an “absence-present”, something that is left aside, as happens with the sound of many household appliances. They form a kind of white noise like that produced by refrigerators, washing machines, heaters, air conditioners, fans; they are relations that are ignored, because they are part of the technological texture of the world. This happens when the electronic device and the user actions are assumed in such a way that they cease to be notoriously perceived. Here are, from the information collected, some samples of how this relationship is configured: “At times I forget that it is a technological device and I feel that I am reading a book”.

“I like having it in my hands, except that it is very light it's very pretty, it's like having a block board. Touching it with your finger and making it move is like a kind of glamour. I find it comfortable; I can even move it with my foot. It is building a world with fingertips and touch”. (E.E. Gómez. personal communication, December, 26, 2016)

With electronic reading devices this relationship is expressed when they stop being compared with books and become naturalized, when the user settles into a post-digital culture and no longer wonders what he is reading or why he is reading in this or that medium.

Figura 1. *Relations of mediation, according to Don Ihde and Verbeek*



The last type of relations considered by Ihde are what he calls horizontal phenomena. In them, one is at the limit of incorporation, as could happen to a bionic subject. This level could be figuratively exemplified as immersive, and can be presented in the reading, but its clear reference is to extreme situations that present information to the bearer, may be closer to this type of relationship. This level does not yet have a clear way of presenting itself, but it is glimpsed in wearable objects. Perhaps the reader who physically does not get rid of the books, or the citizens of this era who throw themselves into the street with the hand of a mobile phone, prefigure this relationship.

However, to characterize these relations of the reader with electronic devices is fundamental to understand how the technical object is integrated into the experience. In a similar sense, Verbeek (2005, p.122) points out that Ihde's analyses help to investigate the role of artifacts in the significance of relations between human beings and their world.

So characterizing these relationships helps to clarify what is going on when a current reading device is used. It is necessary to keep in mind the scope of the mediation relationship that occurs when electronic devices are included in reading experiences, and at the same time, to think about the design of different types of experiences according to the context and the elements that converge in the process.

One of the most interesting findings refers to the memories of reading experiences. When the participants told their readers' stories, they mentioned the conditions under which they read, what the books were like, where they had read, in short, they remembered the act of reading very strongly and had almost completely forgotten the content of what they had read.

From this, it can be effectively inferred that the reading experience, in terms of its materiality and physical conditions, in short, its instrumental mediation, creates a mark on the reader. From this, we can conclude that the conditions surrounding the reading are indeed valuable for the subject reader and can be the object of intervention. Remembering the metaphor of the wine and the bottles, it would then be said that the bottles are part of the wine.

Users have a tendency to integrate accessories into the electronic device. When users are in possession of the devices or have them at their disposal for several days, they tend to establish an alterity relationship with the object. A very marked constant in the reading tests carried out was the predilection for electronic ink devices rather than tablets. Of the 19 short reading tests performed, only two people were inclined to use the LED display tablet.

All of the participants who had the on-screen reading experience mentioned that they would read again on a device similar to the one they had used. An interesting and reiterative element in the appreciations given by the readers was the sensation of reading faster and not being aware of the pages that are still missing, since the physical dimension of the book is lost sight of. It is also important to consider that all the readers who tested electronic devices stated that they would lend

such devices if the libraries offered them. For those interested in promoting reading in digital formats, this knowledge of mediation relationships can be useful in designing strategies in which the devices are more meaningful to users and cater to the profile of readers so that they can be offered the diversity of equipment and accessories for their reading experiences.

Designers of reading devices should also bear in mind that different levels of mediation influence the reader's experience, and for this reason, they may consider which features are relevant to the design of the equipment.

DISCUSSION

Applying Ihde's classifications of human relationships to technology provided an appropriate framework for the phenomenon of reading. For example, to consider whether the reading device, after having started as a relationship of mediation, comes to constitute relations of alterity and background is a matter of interest. What reductions and amplifications occur in this mediation relationship? How does the reading device become embodied?

If we consider that subject and object are imbricated in mediation, the question that emerges in the analysis of digital reading artifacts is whether this experience is such through that mediation, or whether it could be different from mediation through analogous artifacts.

What kind of relationships do readers establish with reading media? In the case of traditional books, it is often observed that readers assume a relationship of alterity with the book as a physical object. It is a common place to refer to books personifying them. We also talk about characteristics such as smell, texture and manipulation. However, phenomenologically we are in front of a relation in diverse planes: the book is not only part of the mediation relations; it also manages to conform otherness relations. Here, too, interaction has a lot to do with it. It was only through a research exercise that it was possible to determine how the subjects who assume this relationship live the reading experience through mediation with electronic devices.

The reading implies a mediated perception because it requires the intervention of a technological device to access the written code, which in itself is a technology. Nevertheless, is it a question of a realisation relationship, of a hermeneutic connection, of alterity, of background? How can an electronic device transform the reading experience?

Electronic ink screens were unknown to most of the people who made the reading experiences in this study. Consumer electronics in Latin America sells very little electronic ink reading machines. Thus, the reactions to these screens were surprising, charming and wonderful. The minimum expression you could hear is “no fatigue”. There is a generalized acceptance of the electronic ink reader device as an option for screen reading, while the mediation relationship with an electronic LED screen equipment tends to be one of rejection because it does not allow concentrating on reading due to eye fatigue, reflections or any other factor, resulting in the device ceasing to be transparent.

The mediation relationships that readers build with electronic devices are, in principle, in the first contact, of otherness. The readers observe the device as an otherness, an object with a certain autonomy, capable of arousing admiration. To the extent that the reader adapts to the devices, the experience improves in terms of a realization relationship, which leads to an incorporation of the device in perception and action, so that on-screen reading can not only give immersion, but can have control over the text that enhances the reading act, perhaps even reaching new forms of visualization and textual manipulation.

Once one assumes the awareness that one has a tool in one's hands, the relationship with the device passes through the different levels of the mediation relationships. By thinking the reading in terms of experience, it will be possible to apply design principles for its realization, also allowing optimizing and adapting the elements involved in it. It will also be possible to offer the user the appropriate scaffolding for their experience. (Sanders, 2001).

Just as Proust (1909) tells us that the memories of reading in childhood have left a deeper imprint in our memory, than what read at the time; in reading, external factors are involved in the content, which make up the mental experience and are indissolubly integrated into the reading. It would be possible to say that these are the contexts of mediation.

It is appropriate to start from this characterization in order to determine in a more effective way the interventions that can be made in the reading experiences, looking for the best possible scaffolding for the reader. In the background, underlies a hypothesis: when passing from one support to another, the reading experience is modified and the reader can adjust with benefit to the changes that are presented to him.

Finally, in order to improve the reading experience, it is essential to understand the phenomena surrounding the use of devices, formats and remedial practices executed on texts, as well as software and hardware. This set of elements requires scaffolding for the reader and the reading promoter, both in the case of libraries and in other academic contexts. This situation extends, of course, to the generality of readers, for whom it is no longer enough to know how to read, but who require greater instruction and willingness to interact with digital interfaces.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article.

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