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The Challenges of Digital Literacy and Reading Skills

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Abstract

Digital literacy is a recent concept that refers to the reading and writing of texts. It covers the development of digital hypertext, as well as the pedagogical and technological components that must be considered for its construction. All this seen from the perspective of distance education. The need to address this type of reading in the new generations is evident. The objective of this research is the study of the understanding of digital hypertext, based on the investigation of academic practices carried out through the technological tools used for the development of virtual classes. The research methodology is qualitative with a hermeneutic methodological approach and the case study research method. The study was developed with university students of the eighth cycle of a university. With these elements, a didactic proposal is designed that strengthens digital reading skills to empower students as hypertextual readers from university contexts.

Keywords: *digital literacy, digital text comprehension, technology, hypertexts*

Introduction

The 21st century scenario presents a new social-virtual space for human interrelationships that impacts all processes of higher education. This scenario directly affects the approaches, pedagogical methods and educational models of the institutions. Reading on the Internet implies a new and particular way of selecting information that is successful depending on the position, attitude and the specificity of the reader's objectives. This perspective has been developing since the 1980s, mainly in England (Barton and Hamilton, 1998; Street, 1984) and in the United States (Gee, 2004).

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Studies of this type have also been carried out in Latin America in recent years. (Kalman, 2003; Zavala, 2002; Zavala, Niño-Murcia and Ames, 2004). In Spain, Cassany (2006) has introduced this current as the sociocultural perspective of reading and writing. Similarly, digital hypertext reading is a concept with a great social impact due to the demand that currently exists for searching for information on the Internet. This paradigm poses several challenges: the pedagogical change in the student-teacher and student-student relationship.

Digital reading allows you to read various digital formats in a single text; aggregates, links and shares information from various sources, allowing access to documents in a non-sequential manner, unlike traditional information systems in which access is sequential (Balasubramanian, 1995). This form of access is not found in linear reading, but it has theoretical coincidences about the way it is read. Based on the above considerations, contributing to the development of knowledge through digital literacy in academic contexts raises the challenge of also strengthening hypertextual reading comprehension from the epistemological perspective of hermeneutics.

The origin of hypertext dates back to 1945. Vannevar Bush, head of the US Department of Scientific Research and Development, published the article "As we may think" in "The Atlantic Monthly" magazine. Bush realized that the sequential structure of the documents did not allow large amounts of information to be properly processed. Based on the above, authors such as Douglas et al., (2012) demand a new way of understanding literacy in the development of reading and writing skills, since it becomes a relevant tool that allows us to understand the new pedagogical, social and technological realities, as well as the complexity that is required to annotate, analyze, investigate and recover multimodal semantic patterns; Azeman et al. (2017); Coiro and Moore (2012); Levratto (2017) among others.

Indeed, hypertext is the interface that predominates in Internet reading and is multimodal. Reading various digital formats in a single text when looking for information, the difference lies in its interface. The interface is multimodal, which is not found in linear reading, although they have theoretical coincidences about the way it is read between the two. Its main difference lies in its structure; hypertext predominates in Internet reading; it has textual grammar and its design combines various forms and formats which require particular reading skills. It should be added that Cruz Piñol (2002) considers that the change from writing and reading to which hypertextuality leads does not affect the computer as a tool, but rather the communication channel.

For this purpose, the World Bank (WB), the Economic Commission for Latin America and the Caribbean (ECLAC), the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Organization for Economic Cooperation and Development Economic Development (OECD) agree that the main objective of education is that young people have the opportunity to acquire skills, aptitudes and knowledge; in addition to incorporating ICT learning. In the same way, digital literacy guides the formation of hypertextual reading skills from the university classroom due to the demand that currently exists for the search for information on the

Internet by students of all educational levels.

Digital Literacy

In university education, activities are developed that require knowledge related to the use of digital resources. The term digital literacy is not typical of the Spanish language, it is adapted from the English language. It refers to training processes and is usually translated as literacy. In English "Literacy"; according to (Cassany & Castellà, 2010) and Ocampo (2018) is related to processes of formation of reading and writing skills at any level of education.

The concept of digital literacy includes the terms of new technologies, literacies, digital media and digital production. O'Brien and Scharber (2008) describe it as the formation of skills, strategies and postures that allow the representation and understanding of ideas carried out in multiple formats. Buckingham (2007) and Belshaw (2012) complement the definition of digital literacy by saying that, because it is multimodal, it can be read in different ways and they emphasize the relevance of learning to access information, locate, understand, (for the researcher understand is the ability to decode or interpret a multimedia format) use, and reflect on hypertextuality.

Likewise the use of literacy is essentially social, not only in the minds of people or in the texts read or written, but also in interpersonal interaction and in what people do with these texts and what these forms mean to them, this social view of literacy adds the perspective of text studies, from a framework in which reading and writing are conceived in the space of thought and text. Its structure is diverse unlike printed material, it contains multiple formats that attract. This class of texts does not have a starting point or an end point, since it is the reader who determines its limits.

Digital literacy must be a priority in the face of new problems that arise in the digital world. The journalist Kuper (2019) maintains that initiatives should be created to teach students to verify and validate the news that is published and identify sources among other skills. Coiro (2015) points out that the key is in the combination of these two elements, since one needs the other. Reading and writing skills are the support to understand the new formats found in hypertext texts. Another key element for the implementation of digital literacy in university educational contexts is the development of teaching materials. Currently, the digital resource has a great influence on university education.

Virtual learning environments

The use of the Internet and the computer in today's society mark the creation of new educational paradigms, in which it is impossible to ignore the use of these tools in the teaching-learning process. This duality of computer applications allows interaction and the creation of knowledge. These applications have been called Virtual Learning Environments defined as a virtual space that allows alternative forms of learning through the Internet.

Virtualization in the educational process demands delving into learning environments and the contribution of the virtual to innovation in the world. A virtual learning environment is the set of

interaction environments, synchronous and asynchronous through a learning system. EVAs are increasingly common in the educational field and their purpose is to offer flexibility to the student in their training.

Likewise, a methodological proposal to apply in virtual learning environments must be based on pedagogical and didactic foundations since creating an academic environment is not transferring teaching from a physical classroom to a virtual one, it is necessary to know the available technological resources such as: infrastructure, media, information resources among others. Virtual environments as teaching and learning spaces propose a constructivist approach based on pedagogical and didactic principles.

For Manny 2000, as cited by Braslavsky (2003), literacy is the construction of knowledge of the world and this term is adapted from the English language. It also refers to training processes and is usually translated in English as Literacy. According to Cassany & Casstellà, 2010 and Ocampo (2018), it is related to the processes of training reading and writing skills at any educational level. For Manny, 2000 and Braslavsky (2003), literacy is the construction of knowledge of the world. Based on the above, the researchers have named it in Spanish literacy.

Study of digital knowledge

The researchers Morales and Olguín (2015) carried out an analysis of digital knowledge at a higher level based on the digital skills or abilities proposed by organizations such as the OECD, UNESCO, the European Computer Driving License Foundation (ECDL Foundation) and the International Society for Technology in Education (ISTE) in order to establish standards of digital skills that allow promoting the development of the individual in the labor, social and educational environment.

Similarly, the Tuning Project (2011-2013) presents a series of skills with the aim of improving the quality, efficiency and transparency of information in generic skills related to ICTs such as: developing skills in the use of technologies information and communication; skills to search, process and analyze information from various sources. For this reason, it is essential that universities consider in their curriculum the development and training of the critical use of ICT, as well as using digital and technological media as a bridge to go from basic skills to the most complex.

Authors such as Gee (2008); Lankshear & Knobel (2006); Gilster, (1997); Street (1995); Kress (2003); Cope & Kalantzis (2000), ensure that people with critical digital skills are necessary for subjects to socialize and exchange information in digital media. Information and Communication Technologies (ICT) in education imply that the student must be competent in the use of digital tools.

For this, it is necessary to know the degree of technological appropriation that students have about digital knowledge; Ramirez and Casillas (2014). After consulting how much they know, what they know, why and how often they use technologies in the classroom, the objective of this research is

to study the understanding of digital hypertext, based on the investigation of academic practices carried out through the technological tools used for the development of virtual classes. An analysis of the information was carried out and it was possible to argue that students must be competent in digital knowledge and assume it on a daily basis to facilitate the creation of learning environments.

Another relevant contribution is the work of Matamala and Hinojosa (2020), focused on describing the academic activities that students carry out on the internet. It should be noted that most research focuses on university students and adult readers of hypertexts. However, in the search that was carried out on hypertexts, the works found give valuable contributions to continue building and investigating the subject.

Pedagogical-didactic component of hypertext in digital texts

It is necessary to know the didactic pedagogical procedure of hypertext in order to identify the role of a reader in hypertextuality and reveal the problems of students to face how to integrate texts on the Internet with coherence or generate a new product with what is read; when searching for information on the network, most of them are sensitive to simple queries without contrasting, comparing or strengthening the search for content on international research carried out in school contexts focused on hypertextuality and digital literacy and finally hypertextual reading.

Hypertext facilitates communication between the triad: teacher - student – content, in a reflexive and complex way; Rodriguez (1991). It should be added that complex thinking allows the location of information, multidimensionality and the global. Similarly, Stash (2003, p. 235) states that hypertexts can fulfill different functions depending on their application and use in the teaching-learning process: show knowledge through electronic libraries, incorporate knowledge through graphic schemes and use hypertext to promote the construction of knowledge.

In this sense, Jonassen (2000, p. 148) maintains that hypertext fulfills the function of a cognitive tool in the construction of knowledge, during which students can show the multiple realities that exist in the world. The digital support of hypertext enables the incorporation of various visual languages such as writing, still or moving images, sounds, music, voice, animations, videos, etc.

Research on the pedagogical use of hypertext and student learning routes print strengths (Jonassen, 2000): that is, they show their potential to develop associative and relational thinking; also, the integration of knowledge, the autonomy of the student, the development of search skills, access and storage of information. Similarly, Blom et al. (2018) when working on this type of reading in high school students in the United States, they assure that in recent years the trend towards digital reading has increased. It is established that the reading of hypertexts is more difficult to understand than linear reading; in digital or printed formats the lexical deficiency is notable to have a better reading comprehension.

Historical development of hypertext

The technological advances of the last decades spread the notion of hypertext. Carr considers

hypertext to be a collection of information nodes that are linked; being the author the one who creates the nodes and the links between them, so that the reader can go through them (Carr, 1988). In this definition, the functions of the reader are limited to traversing the links, however, it is considered that, during the action of reading, new nodes and links can be established.

For his part, Salaverria (2000) defines hypertext as the link (linking) of pieces of information and using those links to access other related ones, that is, an element of information or node can be from a simple idea. According to Torres and Pérez, the information is not limited to written or textual information, but can be images, sounds, audiovisual documents, Web pages or any other form of digital action, among others (Torres and Pérez, 2017).

In this regard Travis (2000), expresses that this conception has evolved in recent years in which a set of technologies and standards that lead to a new panorama in Web-based education is structured. The need to reuse materials on different platforms and types of students has generated the creation of standards that allow the search and distribution of the educational content that is generated.

The hypertext reading

There are several authors who have investigated hypertextual reading from different perspectives, one of them is from literature (Mendoza, 2008; Borrás, 2005; Pajares, 2004 and 2005). However, it is necessary to analyze the hypertext. Hypertext is an expanded text in its etymological definition, a huge text of transtextual creation; interrelated, divided, mixed with images or sounds that leads to a non-sequential, multi-line or multi-sequential reading. These characteristics force the reader to have a dynamic reading and to become someone who assembles disordered pieces, from diverse origins, maintaining the textual model that is offered to the reading, in which the reader confers his personal interpretation, according to his capabilities and their social experience Borrás, 2005 and 2012; Genette, 1982; Landow, (1995).

For his part, Nielsen (1990) highlights, in favor of the hypertext structure, alternative readings, characterized by the exploration of other visual and auditory media that convert hypertext into a 'hypermedia' environment given that the structure of connections lends itself optimal to represent semantic networks in analogy. Resorting to the construction and reading of hypertext allows us to differentiate the types of hypertexts formulated by Umberto Eco (2003). Hypertext gives access to the texts or works that are its references and forms a set of infinite possibilities, with relevant repercussions on the requirements of hypertext reading and writing skills. The latter is the type of hypertext that students face the most.

After systematizing the bibliography consulted in some definitions of the term hypertext (Pérez, 2014; Nelson, 1992; Carr, 1988; Tomei, 1997), the convergence of the following criteria is recognized: It is a unified concept of interconnected ideas, data and knowledge on a computer screen and that has a start that can be variable. It also represents human knowledge that operates by association, jumping from one item to the next, almost instantaneously. The reading sequence

is determined by the reader as he reads, scrolls, or fixes the organizing principle. Hypertext design corresponds to the breakdown, reorganization and redistribution of texts to be read according to the needs of the reader. Fundamentally, hypertext allows for a horizontal relationship between writer and reader.

Hypertext reading strategies

There are some studies on the strategies that students carry out when they read hypertexts, such as Salmerón and García (2011), who expose the relationship between navigation strategies, reading skills and comprehension skills. On the other hand, De Stéfano and LeFevre (2007) carried out an investigation in which they used a hypertext reading process model to determine the characteristics of hypertext during navigation and text comprehension. A big question arises in the university environment and it is: how to introduce hypertextual reading in the university academic environment?

On the other hand, researchers such as Sung, Chang and Huang (2008) have investigated how to innovate computer-supported educational processes to improve digital reading. These authors, through their CASTLE (Computer Assisted Strategy Teaching and Learning Environment) tool, focus on the development of attention-concentration, selection, organization, integration and monitoring strategies. It can be pointed out that the classes closest to the digital are highlighted by the need to know the composition or operation of software or hardware, beyond the training of digital reading skills, such as a skill of reading on the Internet or be the integration of hypertextual texts, unifying the contributions on the subject, Brante and Strømsø (2017) and Salmerón et al. (2018). This ability concentrates several processes that will enrich the comprehension of hypertext texts in the reader, especially in readers in university training. It is highlighted that with the case study conditions could be evidenced to be able to strengthen the reading ability in class and make actions visible.

In this research, the hermeneutic perspective is assumed, which facilitates making visible meanings of an academic context for a better understanding. In this work, the positions of Ricoeur (2002) and Gadamer (2013) are assumed, since both glimpse significant elements in hermeneutics to take into account in the handling of information, as well, to investigate, analyze and interpret actions that occur in a specific context when dealing with digital hypertext reading.

Investigation methodology

It is qualitative research with a hermeneutic methodological approach and the case study research method. The study population is made up of 60 students from the seventh and eighth cycle c. The sample is of 30 students of which 68% were women and 33% percent were men. The survey to collect data was applied to 30 university students. The data was processed based on the SPSS program. The objective of this study aimed to collect information with the group of students in question and to meet the objective of identifying the reading skills that contribute to the consolidation and integration of hypertext texts in eighth cycle students. The materials used were

computers, internet and work guides.

In the development of the research, the emerging need to promote and consolidate hypertextual reading comprehension was appreciated from virtuality. A large part of the educators had never had the opportunity to work from a computer, therefore, we were trained in its use and application.

The closest thing to the device was to make digital presentations even without knowledge of the management of hypertext reading in virtual contexts; that they edit their own readings, that deal with open and fluctuating texts, susceptible to reconstructions, in other words, to hypertextual texts. Currently you can find a significant number of investigations such as those of Cassany (2004); Fainholc (2004); Coiro (2011); Van Deursen and Van Dijk (2014); Galindo (2015); Levatto (2017); Albarello (2019); Brante (2019); Salmeron (2019); Montejo and Jiménez (2019) and Amador (2021), who theoretically explain the characterization of the hypertextual structure and the skills that must be developed in hypertextual readers.

The most important thing is to build a set of didactic tools to promote and motivate hypertext reading in university students. It is a contribution that does not focus on a subject or discipline, but can be replicated in any academic environment along with the reflections and recommendations for its implementation. It may sound strange that a didactic material is a point of connection of different subjects in a university.

Table 1: Percentage of students with the ability to search for information.

	None	Little skilled	Moderately skilled	Very skilled	Expert
means	20	22	25	9	24
strategies	21.8	27.3	10.0	21.8	18.2

Source: Own elaboration (2022)

When investigating the means by which university students seek information, the highest percentage is concentrated in search engines and pages such as Google, YouTube, Wikipedia, Bing, Printest.

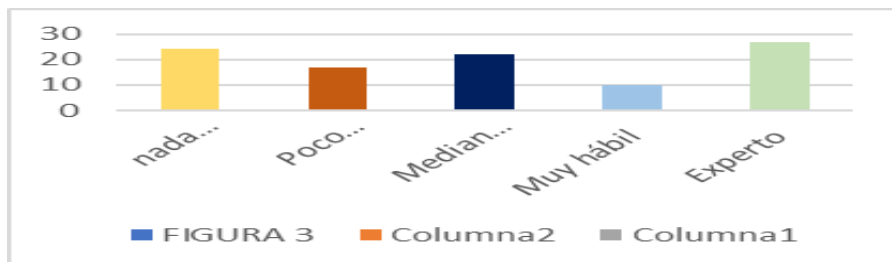


Figure 1. Percentage of students who have skills in managing and evaluating hypertext information.

Source: own elaboration (2022).

Regarding the ability, Fainholm (2004) proposes three stages for a hypertextual reading: the first one is called pretextual; at this point the reader does not have control over the hypertexts, but over the information. He follows the intermediate stage; here the reader uses and dominates simple hypertexts, with little information and great graphic content; and finally mature reading, where the reader is aware of structuring the information found on the network and uses strategies in accordance with the structure of the hypertext.

The contributions have points of convergence that have been worked on in later research works. The idea is to strengthen the hypertextual reading processes according to the comprehension domain of a digital reader, and not in the development of a skill typical of reading on the Internet and the integration of hypertextual texts, unifying the contributions on the subject that Brante and Strømsø (2017) and Salmerón et al. (2018). This ability concentrates several processes that will enrich the comprehension of hypertext texts, especially in developing readers. It is highlighted that with the case study it was possible to demonstrate conditions to strengthen the hypertext reading ability.

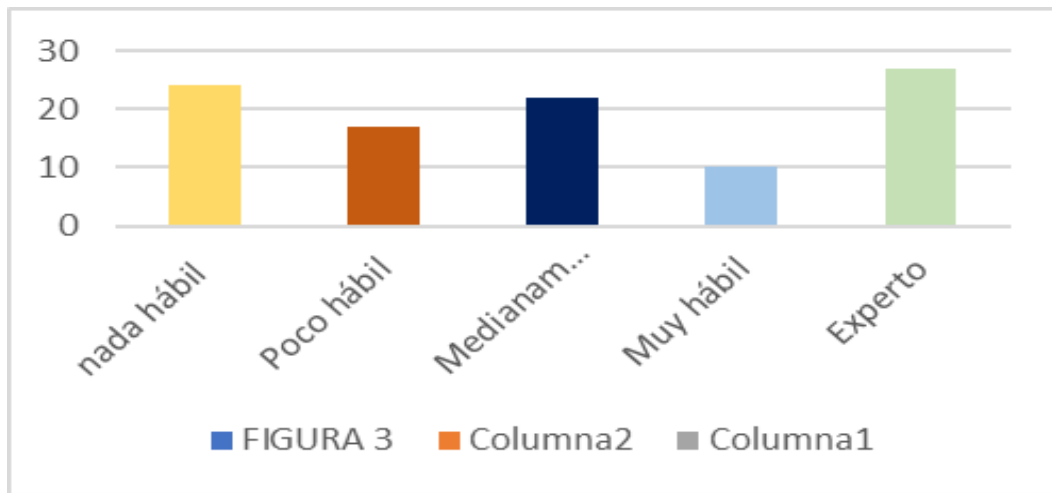


Figure 2: Percentage of students who have skills in reading information.

Source: own elaboration (2022).

In the first interventions, it was asked about how many pages they consulted in a search when they do a homework or academic activity, and a high percentage of the students stated that they only checked between the first and third links offered by the search engine. When investigating the reason, they agreed that the initial information satisfied their need for consultation and seemed sufficient to them.

We can affirm that reading ability affects the quality of digital argumentative essays produced by subjects who are in the terminal stage of their integration of hypertextual texts and formation of a reading ability to integrate hypertextual texts:

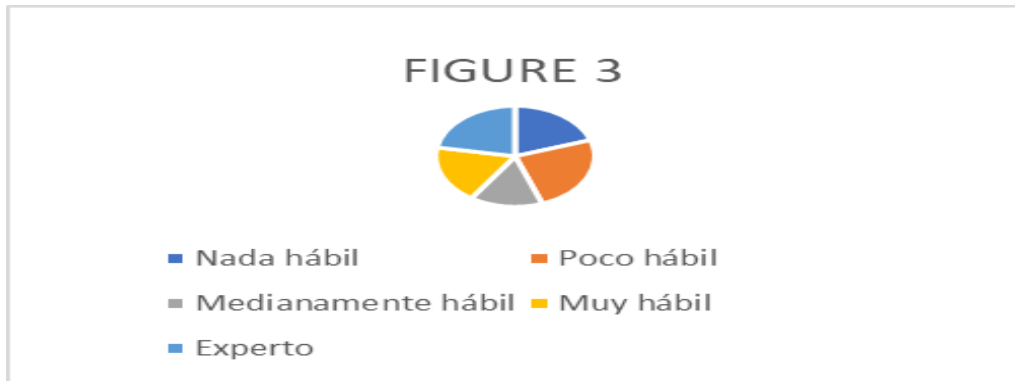


Figure 3: Percentage of students who have the ability to integrate hypertext information in the academic environment.

Source: Own elaboration (2022).

University students must have the ability to appropriately handle different formats of information, process it and convert it into knowledge. Likewise, accessing and retrieving textual information (page of a virtual book, a table or a list) involves skills associated with searching, selecting and gathering hypertextual information. Integrating and interpreting requires the reader to understand the relationship between different parts of a text and hypertext, as well as demonstrate their coherence.

Conclusions

The results obtained describe the use of hypertext texts in a classroom. This section is composed of the following topic: classification of hypertext reading skills. The search for information on the network demands particular skills, such as those proposed by Ruiz et al. (2017) It is proposed to identify relevant details in the search, ask questions about the topic to give an accurate value judgment about its credibility, qualify the sources with the previous review of the domain of the URL address of the pages, the authors of the text and the degree of difficulty of the information.

In addition, take advantage of the multitasking option that digital offers to keep several windows open simultaneously in order to scan the contents and unify the information to delve into the content of a topic. In the same way, the main idea is identified, making inferences, analyzing and interpreting the content, synthesizing, predicting, hypothesizing, paraphrasing, encoding and decoding texts to reconstruct the global meaning of the text, as well as reading fluency, locate, select and retrieve data, among others.

Likewise there are the operational skills of hypertextuality. According to Van Dijk and Van Deursen (2014) they are related to opening files on the internet, collecting and saving information, choosing the search engine of your choice, placing keywords to find content, commenting on what you read, among other skills. Skills that are used in both print and hypertext reading, for example, reading

fluency skill propose reading print texts fluently, easily and efficiently. In hypertext reading, it is established that the fluency of reading on the Internet is related to the number of words or ideas that can be omitted in order to achieve effective reading. In hypertext reading, the following stand out: the knowledge one has about a certain topic and the pre-knowledge about the operational use of the Internet.

Multi-reading comprehension with intervention tasks seeks to investigate how to strengthen the student's hypertextual reading skills that are really necessary to improve the integration of hypertextual texts and their comprehension, such as those proposed by Braasch (2020), namely, the use of motors search, locate information, find relevant information within the sources consulted, increase vocabulary, organize and rank information, activate short- and long-term memory; compare, contrast information and other actions involved in this type of reading.

It should be added that in order to prevent the integration of information from being diffuse in terms of terminology or rhetoric, it should be guided by topics according to the cognitive level, since reading hypertexts is a much more demanding effort than when reading online a single format, since it is not usual in the classes they take. Salmeron et al. (2018) express that this entire intertextual process is mixed with operational skills. In this way, gradually, the low levels of the reading cognitive processes proposed by Wylie et al. (2018) such as memorization and attention, more specifically word recognition, coding processes, syntactic and semantic analysis, among others.

It is pertinent to underline that the construction of the proposed work achieves a resignification of the hypertext and the information gathered on a subject. In the same way, it unifies the lexicons of other readers to build a new message and boost learning. These spaces allow students to get closer to reading; they are unfinished proposals, sometimes it is relevant information that can give clarity and depth, and also allows adaptation to different contexts and time. The idea of this type of activities is to generate interest to improve reading comprehension; raising the critical level and through encouraging communication. The student not only performs the activity to obtain a grade but also to promote their communication channels.

In most of the works reviewed, it can be observed that in the reading of hypertexts, three macro skills are fulfilled: navigate, integrate and evaluate information, which consolidate the skills of reading on the Internet and support that they are developed separately. The use of these skills in this research has the purpose that students assume the theoretical knowledge that allowed the construction of a set of didactic tools to promote and motivate hypertextual reading in university students. In addition, it is a teacher-to-teacher contribution that does not focus on one subject or discipline, but can be replicated in any academic environment along with the reflections and recommendations for its implementation.

In this sense, the discussion should not be about whether the student is a digital native or not, it implies developing skills that are appropriate to the needs of the digital culture. This demands

changes in the formation of the new generations, for this reason, it is suggested to arrive with a material that involves their tastes and their daily life, with the advantage of having the freedom to use the contributions of others to resignify them to their measure.



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