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REVIEW ARTICLE

Theoretical references on reading and writing in the academic-research training of health professionals

Referentes teóricos sobre lectura y escritura en la formación académico-investigativa de los profesionales de la salud

Referenciais teóricos sobre leitura e escrita na formação acadêmico-pesquisa de profissionais de saúde

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ABSTRACT

Introduction: reading and writing constitute essential practices in learning, research and scientific communication. **Objective:** to identify the key theories and concepts about college reading and writing appropriate to support the academic-research training of health professionals. **Method:** a bibliographic review was developed (October 2022 - April 2023), based on the following phases: information search, evaluation, analysis and synthesis. Keywords were used combined in different search equations: research training, research skills, science communication, communication skills, reading, and writing. 238 documents were located; 131 were excluded based on the determined criteria. **Development:** the main contributions were determined in the evaluation phase, through recurring readings and analysis sheets. In the analysis phase, content sheets were prepared with the main concepts, after grouping the articles into thematic groups. In the synthesis phase, the main theoretical approaches were identified. The resulting body of ideas is organized as follows: reading and writing in academic-research training, literacy and academic literacy, reading and critical thinking, academic writing and reading and writing in digital environments. **Final considerations:** there is sufficient theoretical background to support scientific communication in the academic-research training of health professionals. The possibility of pedagogically supporting communicative interaction in the appropriation of information and the construction of knowledge in disciplinary contexts is confirmed.

Keywords: scientific communication and dissemination; academic communication; medical education; writing; reading; critical thinking; health personnel

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RESUMEN

Introducción: la lectura y la escritura constituyen prácticas esenciales en el aprendizaje, la investigación y la comunicación científica. **Objetivo**: identificar las teorías y conceptos claves sobre la lectura y la escritura universitaria apropiados para sustentar la formación académico-investigativa de los profesionales de la salud. **Método**: se desarrolló una revisión bibliográfica (octubre de 2022 - abril de 2023), a partir de las siguientes fases: búsqueda de información, evaluación, análisis y síntesis. Se utilizaron palabras clave combinadas en diferentes ecuaciones de búsqueda: formación investigativa, habilidades investigativas, comunicación de la ciencia, habilidades comunicativas, lectura, escritura. Se localizaron 238 documentos; se excluyeron 131a partir de los criterios determinados. **Desarrollo**: se determinaron los principales aportes en la fase de evaluación, mediante lecturas recurrentes y fichas de análisis. En la fase de análisis se elaboraron fichas de contenido con los conceptos principales, previo agrupamiento de los artículos en grupos temáticos. En la fase de síntesis se identificaron los principales enfoques teóricos. El cuerpo de ideas resultante se organiza como sigue: la lectura y la escritura en la formación académico-investigativa, literacidad y alfabetización académica, lectura y pensamiento crítico, la escritura académica y lectura y escritura en entornos digitales. **Consideraciones finales**: existe suficiente respaldo teórico para sustentar la comunicación científica enla formación académico-investigativa de los profesionales de la salud. Se confirma la posibilidad de sustentar pedagógicamente la interacción comunicativa en la apropiación de información y la construcción del conocimiento en contextos disciplinares.

Palabras clave: comunicación y divulgación científica; comunicación académica; educación médica; escritura; lectura; pensamiento crítico; personal de salud

RESUMO

Introdução: a leitura e a escrita constituem práticas essenciais na aprendizagem, na pesquisa e na comunicação científica.**Objetivo:** identificar as principais teorias e conceitos sobre leitura e escrita universitária adequados para subsidiar a formação acadêmico-pesquisadora de profissionais de saúde.**Método:** foi desenvolvida uma revisão bibliográfica (outubro de 2022 - abril de 2023), baseada nas seguintes fases: busca de informações, avaliação, análise e síntese.Foram utilizadas palavras-chave combinadas em diferentes equações de busca: formação em pesquisa, habilidades de pesquisa, comunicação científica, habilidades de comunicação, leitura, escrita.Foram localizados 238 documentos;131 foram excluídos com base nos critérios determinados. **Desenvolvimento:** as principais contribuições foram determinadas na fase de avaliação, por meio de leituras recorrentes e fichas de análise.Na fase de análise foram elaboradas fichas de conteúdo com os principais conceitos, após agrupamento dos artigos em grupos temáticos.Na fase de síntese foram identificadas as principais abordagens teóricas.O conjunto de ideias resultante está organizado da seguinte forma: leitura e escrita na formação acadêmica-investigadora, alfabetização e literacia acadêmica, leitura e pensamento crítico, escrita acadêmica e leitura e escrita em ambientes digitais.**Considerações finais:** há respaldo teórico suficiente para fundamentar a comunicação científica na formação acadêmico-pesquisadora dos profissionais de saúde.Confirma-se a possibilidade de apoiar pedagogicamente a interação comunicativa na apropriação da informação e na construção do conhecimento em contextos disciplinares.

Palavras-chave: comunicação e divulgação científica;comunicação acadêmica;educação médica;escrita;leitura;pensamento critico;pessoal desaúd

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INTRODUCTION

The internationalization of the academic debate and of the standards of evaluation of the quality of university management poses demands to the academic-research training of health professionals.

The scientific-research activity and self-preparation are two of the organizational forms of teaching work in Cuban Higher Education with greater possibilities of contributing to this social task. The first aims to train the skills of the scientific-research activity; the second, inherent to all organizational forms of teaching work, is the gradual development of students' cognitive independence, of their habits of self-control and responsibility to achieve the desired learning.[1]

The academic-research training of health professionals involves the mediation of reading and writing practices that prepare them for: the development of critical thinking, communicating efficiently in the academic context marked by conventions, genres and disciplinary practices specific to teaching, research and health care work, as well as for professional interaction in digital environments with their own identity.

The research originates from the need to scientifically address the problem of reading and writing in scientific and academic communication at the Medical Sciences University of Ciego de Avila. Undergraduate and graduate students have limitations in the development of communicative skills (reading, writing, speaking, listening, navigating, and interacting); low scientific production is observed, excessive memorization and use of reproductive learning methods in the performance of independent work, which hinder the expression of their own thinking, among others.

It is known the existence of research and actions of teaching-methodological and scientific-methodological work dedicated to research training at undergraduate and graduate levels, the development of research skills, scientific communication and scientific thinking,(2,3,4) which reveal conceptual dispersion and inconsistent approaches among them.

There are important contributions more updated and congruent with current needs on: academic literacy, writing in research, literacy,[5,6,7,8] critical reading, critical thinking, reading of scientific texts, didactics of discursive genres,[9,10,11,12] as well as contributions on information literacy and interaction in digital environments,[13,14,15] with possibilities of articulation for a comprehensive approach to the object of research.

In order to have a conceptual framework for the research process, a systematized literature review was conducted in response to the question: what are the main theories and key concepts on university reading and writing today? The objective is to identify the key theories and concepts on university reading and writing appropriate to support the academic-research training of health professionals.

METHOD

A literature review was developed (October 2022 - April 2023) through the following phases: information search, evaluation, analysis and synthesis. Keywords combined in different search equations were used: research training, research skills, science communication, communication skills, reading, and writing. Priority was given to scientific articles as type of source, between five to ten years of publication, Latin American origin, indexing in SciELO and written in Spanish. A total of 238 documents were located.

In the evaluation phase, a total reading of each document was carried out based on the following exclusion criteria: sources lacking solid theoretical foundations or that did not have the expected quality for the purposes of the research. A total of 131 were excluded on the basis of the criteria determined. The study unit consisted of 107 documents (44.9% of the total located): 69 articles, 17 scientific essays, 10 books, five theses, one editorial and five others (communications in congresses, teaching support materials, conferences).

The analysis phase was developed through recurrent readings and the elaboration of a content card for each document, with the main contributions, as well as observations and critical reflections.

The synthesis phase consisted of organizing the information, from the general to the particular: reading and writing in academic-research training, literacy and academic literacy, reading and critical thinking, academic writing, and reading and writing in digital environments.

DEVELOPMENT

Results of the search phase

It was carried out on the basis of the following terms combined in different search equations: scientific thinking, research training, research skills, science communication, communication skills, scientific writing, scientific writing, and reading. The initial reading focused on the title, abstract and keywords (in the case of articles) and the introduction for other types of sources. A total of 238 documents were located.

Results of the evaluation phase

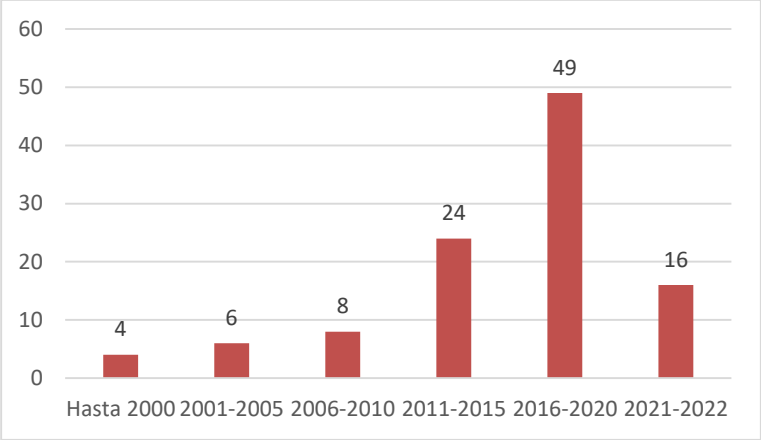
A register was prepared where information on each document was recorded, with the following entries: order number, identifier, bibliographic reference, type of source, year of publication, keywords and country of origin.

After the total reading of each one and following the predetermined exclusion criteria, a set of 169 documents was available, which were read again based on the following exclusion criteria:

- Proposals that were very specific or focused on teaching levels different from the research interests.
- Documents that implied information overload.

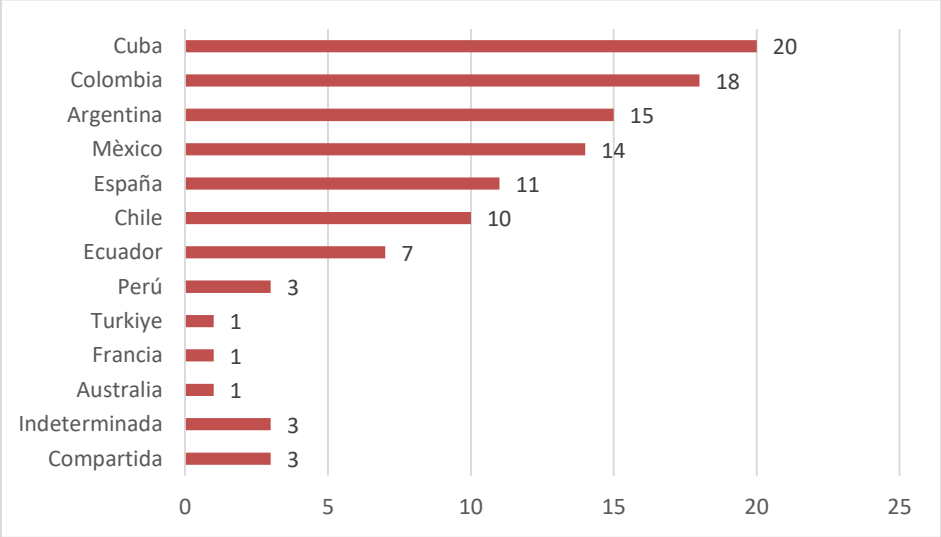
The study unit, made up of 107 documents, responds to the specific interests of the research: the articulation of theories that allow an integral approach to a problem involving thinking, research, information and knowledge management, communication, reading and writing as transversal axes.

According to the date of publication (Graph 1), 42% of the documents were published in the last five years and 35.5% in the last ten years.



Graph 1 Date of publication

According to origin (Graph 2), the most represented countries in descending order are: Cuba, Colombia, Argentina and Mexico.



Graph 2 Country of origin

Results of the analysis phase

Through recurrent readings and the elaboration of content cards, the main contributions were identified, as well as critical observations and reflections.

The determination of the contributions took into account the main communicative intention of the text (conceptualizing, analyzing, characterizing, reflecting, proposing), as well as its relevance and potential contribution to the purposes of the research. Among the most important conceptualizations were the following: information, knowledge, communication, literacy, critical reading, critical thinking, critical literacy, academic literacy, critical literacy, academic texts, critical thinking skills, academic literacy, disciplinary literacy, disciplinary literacy, discursive genre.

The documents whose main communicative intention was to analyze, address contents such as the following: thinking-language relationship, students' writing problems, reading and critical thinking processes, logic of scientific discovery, epistemic dimension of reading, writing, teaching academic writing, research training process, reading as communicative interaction, hypertextual reading, critical thinking as a skill, trends and models of research on academic reading, situated discursive practices, scientific knowledge-scientific information relationship.

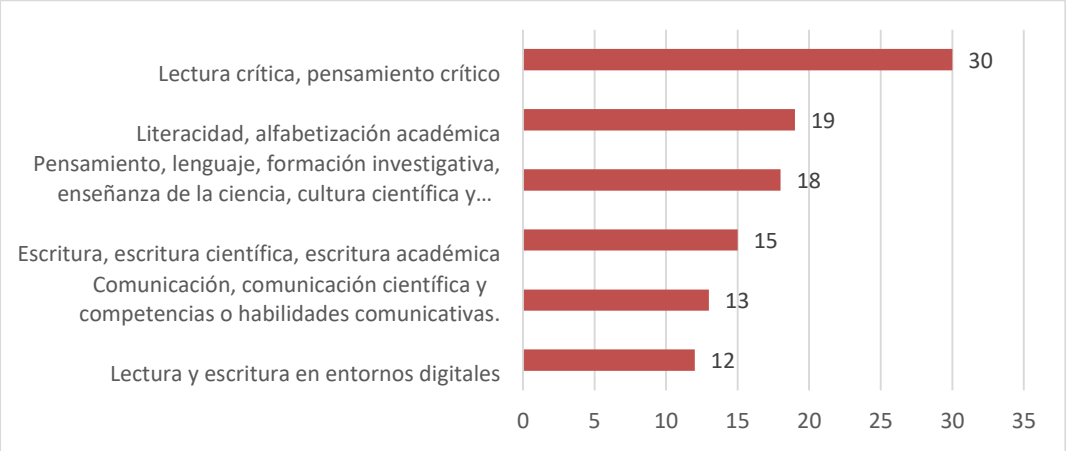
The communicative intention to characterize addressed: the distinctive features of: critical thinking, critical reading, research skills, scientific language, scientific discourse and literacy.

The documents dedicated to reflect refer to: the new textual forms imposed by information and knowledge technologies, teaching to think, attitudes towards science and research, limitations in the development of critical thinking in students, literate education as a project for the formation of subjects with a voice, capacity and disposition to think and speak for themselves, the reader and reading in the digital environment.

The documents whose communicative intention was to propose offer: standards in informational competences in scientific communication, performance indicators in critical thinking, didactics for academic writing, guides to critically analyze scientific articles in medical education.

In this phase, the articles were grouped according to key words, in order to carry out the analytical reading by groups of documents related to their subject matter (Graph 3).

The preparation of content sheets with the main concepts and criteria helped to identify the most general approaches to each thematic group.



.**Graph3**Thematicgroups

Results of the synthesis phase

The synthesized contents are addressed indistinctly in both sources; they are indissoluble. The synthesis presented below does not give an account of the general state of the art of research on the subject; it consists of a structuring of the findings (main theoretical approaches) identified in a unit of analysis determined by the specific interests of the research.

With the purpose of ordering the information and enriching the methodological value of the resulting body of ideas, they were organized from the general to the particular as follows: reading and writing in academic-research training, literacy and academic literacy, reading and critical thinking, academic writing and reading, and writing in digital environments.

Reading and writing in academic-research education

A basic reference in this analysis has to do with scientific communication, generating the necessary culture to receive, understand process and use scientific information. Frequently, some of the sources that deal with scientific communication skills refer to them only in relation to the use of technologies or to the socialization of scientific results.[16,17]

According to a historical tendency study of the training process of the research component in the Medicine career from 2007 to 2022, a tendency to strengthen the research component is identified, however, the skills to communicate the results of the research activity continue to be among the most depressed; the documents do not make explicit how to treat the communication and socialization of the results of the student's research activity, and it is concluded that scientific communication has been a topic insufficiently addressed in the undergraduate program.[18]

Vázquez and Manassero[19] refer to the provisional nature of knowledge, its permanent openness to revision and change; they consider that the identification of scientific issues implies, among other competences, recognizing what is researchable from science and using strategies to search, understand and select scientific information. This idea is essential in the academic-research training of professionals; it implies providing the necessary opportunities and guidance for the management of information and knowledge inherent to the self-management of learning.

In that information-knowledge-communication articulation, the importance of language and its impact on the process of construction of the scientific problem is recognized: linguistic limitations hinder the precision of the theoretical-methodological designs, the problematization, the relationship between the known and the unknown, and the determination of the epistemological gap.[2]

This perspective is distinguished by considering the importance of the linguistic-communicative aspect, inherent to reading and writing practices, throughout the entire research process and not only in the stage of socialization of results. They are valued as essential practices inherent to the research activity, due to their value for the construction of scientific knowledge and for the exchange, dissemination and socialization of results.

In terms of scientific activity, speaking and writing are considered dialectical categories present throughout the entire research process; therefore, the approach to the problems of scientific writing should be based on the scientific production itself.[20] This leads to a didactic reconsideration of the language-thinking-learning relationship, whose current approach rejects the teaching of reading and writing as ends in themselves and advocates their teaching from contextual, intertextual, disciplinary referents, as situated discursive practices.[21,22]

Consequently, didactic attention to reading and writing in medical education implies the development of scientific communication skills as part of the whole research process; it implies considering that reading and writing are not ends in themselves, but practices situated in disciplinary contexts for the acquisition of specialized knowledge; that teaching a subject is teaching to read and write according to the particular codes and conventions of that discipline; that reading and writing is not something that is learned at once: the ways of reading and writing in the university must be taught at the university.[23,24]

Literacy and academic literacy

We did not find precise concepts of literacy and academic literacy recognized and shared among the sources consulted; social practices, notion, approaches, process, are some of the denominations used to refer to them. However, a sufficiently coherent characterization is available to distinguish their essential distinctive features.

Literacy is conceived as the discursive practices specific to higher education, which inseparably include the acts of reading, writing, speaking and thinking according to the frameworks and conventions of academic communities and disciplines.[25] It encompasses the written code, discursive genres, the roles of author and reader, ways of thinking, identity and the status of the individual or collective, as well as cultural values and representations.[26]

There is a consensus regarding the vision of literacy, the role of reading and writing in a discipline, with respect to the specific ways of questioning, constructing and disseminating knowledge.[25] Literacy implies the active participation of individuals in the culture of writing: knowledge of discursive genres, the roles of interlocutors in written communication, ways of thinking and procedures for observing reality, the presentation of information and reasoning associated with written discourse, and the identity and status that members of a community have acquired through the use of writing.[21]

We agree with Zavala [27] that the process of learning to write should contribute to the preparation of individuals for their insertion in specific communities, to participate in the literate sociocultural practices that define an academic community. This perspective derives in the so-called disciplinary literacy: the possibility of accessing knowledge, selecting sources of information, reading, writing and arguing with a specialized discourse.[22]

The specialization of studies on this subject contributes other conceptualizations centered on disciplinary knowledge and the educational context: disciplinary literacy and disciplinary literacy; the former defined as a type of practice that occurs within the framework of a specific and restricted domain; a discipline where reading and writing are seen as inherent and essential practices, which can be reproduced, learned and taught. Disciplinary literacy is associated with formal instruction in disciplinary literacy, with the responsibility of teachers who are experts in a discipline to share with their students the ways of reading, writing, speaking, listening, researching, and thinking of the members of that disciplinary community.[21]

Academic literacy contextualizes literacy in the field of university education and the teacher's role is focused on favoring students' access to the written cultures of the disciplines. It is defined as "the set of notions and strategies necessary to participate in the discursive culture of the disciplines, as well as in the activities of production and analysis of texts, required for learning at the university. In this way, it points to the language and thinking practices proper to the higher academic environment. It also designates the process by which one comes to belong to a scientific and/or professional community, precisely by virtue of having appropriated its forms of reasoning instituted through certain conventions of discourse".[5]

According to the literature consulted, and because of its implications in the pedagogical and didactic conception of reading and writing in the medical university, the idea that "all teachers are language teachers is considered essential, since teaching-learning in any subject and university discipline is always mediated by language, texts and discourses".[28]

Academic literacy, literacy and disciplinary literacy form a conceptual core focused on specific sociocultural contexts, valid both for the formation and exercise of citizenship, as well as for participation in disciplinary academic communities. In this aspect of the study of reading practices, the discursive genres are of great importance, particularly the so-called genres of formation, which are required of students in the teaching-learning process, and therefore, they should be taught how to construct them.[29]

The theoretical importance of these contents and approaches is recognized in that it refers to essential elements regarding the role of reading and writing in the communicative interaction of the subject with established knowledge, with information and with emerging knowledge. Consequently, encouraging students' participation in disciplinary discursive practices involves teachers in all academic disciplines.[22]

Reading and critical thinking

In current research, reading and writing focus on the critical reading-writing-critical thinking interaction. Critical reading requires unraveling the significance of the author's discourse, the meaning that emerges from the text, bringing into play the reader's thinking and language.[9] It is not an opinion about a topic, but the exercise of making complex inferences between the reader's knowledge and the knowledge proposed by the text.[10] During critical reading, there is a process of appropriation of knowledge, of insertion in the way of communicating and doing in a scientific community, a way to generate new theoretical and practical-methodological knowledge.[30]

Critical reading is understood as the cognitive process in which the reader is involved in order to reach the deep meaning of the text, its foundations and ideology. It requires unraveling the significance of the author's discourse, of the meaning that emerges from the text;[9] it is characterized by an acute dialogue capable of generating attitudes in the construction of meaning,[31]by questioning, evaluating the relevance and accuracy of what is read.[32]

The exercise of critical reading fosters the development of critical thinking, one of the main purposes of research on reading and writing. Richard Paul and Linda Elder define critical thinking as the process of analyzing and evaluating thinking for the purpose of improving it.[33] These authors provide performance indicators and dispositions for each of the 25 critical thinking standards they offer; many of them can be applied in the context of medical education.

There are coincidences in the characterization of critical thinking as a form of reflective thinking aimed at the analysis and evaluation of existing communication, information and arguments, which includes reflecting and analyzing texts with deep meaning, and likewise, constructing one's own positions when elaborating a discourse or critical writing. The most widely recognized critical thinking skills in the literature are: analysis, inference, interpretation, explanation, evaluation and self-regulation.[34]

A position that is in line with the interest of this research refers to the dialogic process of reading, where the student, when reading, develops argumentation, supports ideas, identifies implications, causes, effects; it is agreed that synthesis is not the same as copying and pasting information, but requires that the student processes and interacts with the text.[35]

An analysis focused on the application of critical thinking in the practice of medicine starts from the need for a new paradigm for medical education, and specifies the responsibility of the medical teacher beyond the accumulation of scientific content or the development of technical skills: lifelong learning, the rational use of new technologies, community service, autonomy and personal and professional responsibility. He argues that this implies the encouragement of processes of observation, comprehension, reasoning, ability to test hypotheses, identify contradictions and make inferences.[36]

Academic writing

In educational practice, writing is generally seen in its linguistic dimension (grammatical and discursive theories), to the detriment of the cognitive (cognitive processes generated while constructing the text) and social (social praxis where the writer and the reader are permanently interrelated) dimensions. These last two dimensions constitute distinctive features of academic writing, its main differences with respect to the teaching-learning of writing in the educational levels preceding Higher Education.

Among the main functions of writing, the epistemic one is recognized, which allows the construction of new knowledge, developing the author's own ideas, contributing to unveil new angles of a topic and transforming the writer's own knowledge.[29,37,38] During writing there are complex processes of reflection, links with previous readings, planning, organization in a structure of functions, cohesive and thematic links between parts of the text, construction of authorship and authority.[29] Other functions of writing are: the critical function, which favors the agency and positioning of the subjects themselves, and the expressive function, which favors the construction of identities.[29]

From this perspective, the connotation of the teaching of writing in professional training is understood as a process of enculturation in the use of the genres and discursive tools of each discipline and as an instrument for the construction of one's own identity as a member of that discipline.[39] This recognizes the specificity of writing at the university, which cannot be expected to be learned at previous educational levels.

Among the inadequacies of scientific writing, plagiarism and undeclared reformulation(40) are recognized in the literature, in which the author is overshadowed or made invisible in a text excessively plagued by references, with which there is little or no dialogue or discussion, no problematization, no disagreements are established, and the author's opinions and ideological or scientific positions are confused.[41]

These inadequacies constitute obstacles to the expression of the author's own voice and identity.[39,41] Hence, the idea of the construction of the academic voice is defended: to enable students to find a voice in the academic discourse, to find their word, their critical voice, their academic identity. Here it is argued that learning in a discipline requires interacting and communicating through discursive constructions with specialized linguistic marks, assuming a dialogic approach with the texts, that is, reading and writing in accordance with the disciplinary conventions of the discipline.

An interesting theoretical perspective is identified in the conception of the authorship of speech and thought, in which "the individual is seen as an author, not as a mere reproducer of universal laws, grammatical rules and social norms for his linguistic expression (...) he is not a simple user of the code or the linguistic variety he speaks, but conscious of his protagonism in the expression of his thought, the assumption of his own linguistic and sociocultural identity".[43]

Reading and writing in digital environments

Research on reading and writing in digital environments is relatively recent. The works considered here account for the dynamics of information and communication technologies (ICTs) and their influence on reading and writing practices. In general, the conceptual approach is consistent with the body of ideas of the trends discussed above, although it is particularized in accordance with the specificities of the virtual environment.

Since the end of the 20th century and the beginning of the 21st century, publications have expressed theoretical concerns about information, knowledge and communication, especially in relation to the development of information competencies. From this perspective, standards have been defined on skills-faculties in scientific communication and their respective performance indicators in university professors, among which explicit reference is made to the skills of expressing ideas clearly, concisely and coherently to carry out the presentation of oral or written results, applying the principles in scientific writing, identifying and using quality scientific documents, applying techniques to evaluate information.[15]

Such requirements reveal the importance of research on reading and writing in digital environments, given the current demands of communication and scientific collaboration in academic social networks.[44] This, in turn, demands the preparation of professionals to read, write and interact in formats different from the traditional ones, which demand new knowledge, skills and perspectives for the satisfaction of information needs, self-management of knowledge, ways and forms of communication and interaction.

ICT have given rise to new textual forms that imply new ways of reading and writing in the digital environment,[45]and with it new challenges to the educational sciences. In Higher Education, the interaction of undergraduate and graduate students with traditional texts and written code decreases; they use multimedia resources and digital formats. It is shared that many of the young people show playful mastery of digital media and technologies, but have difficulties for their management in the academic context.[46]

According to Cordón,[45] in the reading of traditional texts (based on the written word), the reader tends to concentrate on the content, however, when reading in digital formats, the attention is oriented towards the medium, conflicts of attention and interferences between text and medium are originated. He adds that younger generations are more likely to focus on the multiple possibilities of the medium to the detriment of the text.

We speak of 'hyperreading',[47] a non-linear way of approaching text, of reading non-linear texts, of hypertext "as an enlarged text, enormous, of transtextual creation; interrelated, divided, mixed with images or sounds, a liquid text, which leads to a non-sequential, multi-linear or multi-sequential reading"(48); of ubiquitous learning(49), elements that force a dynamic reading, so that the reader assumes an active role in the ordering, association, restructuring, completion and hierarchization of ideas. And this must be taught.

The call to university institutions is to reevaluate the epistemic value of traditional reading and writing, for teachers to overcome pre-digital pedagogical practices and to build new didactics for digital citizen students.[13]

The challenges of reading and writing in digital environments have to do with the forms of knowledge construction in the digital era. In reference to this, it is suggested that content curation (writing, identification, creation, compilation, assembly, interpretation and reediting of information),[49] requires a critical consumer prepared in different languages, not only in written verbal language, although, according to the authors, this requires the development of metacognitive skills in which writing is the foundation and essence.

The above is revealed in the interest of current research on topics such as digital reading comprehension, digital literacy understood as the integrated management of technical or operational digital skills and cognitive skills.[50]

FINAL CONSIDERATIONS

The bibliographic review presented above reveals sufficient updated theoretical support on the subject of reading and writing as a support for an integral approach to scientific communication in the academic-research training of health professionals. It is considered a current and important object of research in Latin America.

The teaching of university reading and writing should be based on contextual, intertextual and disciplinary references, as situated discursive practices for the access of students to the written cultures of the disciplines. The new textual forms imply new ways of reading and writing in the digital environment, which require the transformation of the concepts and practices of university reading and writing.

The validity of the study to pedagogically support communicative interaction in the appropriation of information and the construction of knowledge in disciplinary contexts is confirmed.

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