UNDERGRADUATE RESEARCH IN THE CONTEXTS OF BASIC AND HIGHER EDUCATION: FROM OFFICIAL DOCUMENTS TO TRAINING ASPECTS

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▪ ABSTRACT: Undergraduate research projects, traditionally implemented in higher education, have also been present at high school level. Based on this reality, we aim at analyzing, comparatively, undergraduate research projects in these two contexts regarding their principles and guidelines recommended in official documents and training aspects in educational practices. In this sense, for both levels of education, we have selected official documents dealing with this science education policy, as well as final reports on undergraduate research projects in the area of Linguistics and Literature. The data were analyzed based on reflections about education through research and studies concerning literacy and academic literacy, using a qualitative-interpretative approach. The analyses indicate that the official documents, in both contexts, are based on similar conceptions, mainly the research as pedagogical principle, but there are investment differences which are significantly bigger in higher education. The reports, in turn, suggest the conduction of similar activities/routines in the process of construction and socialization of scientific knowledge, materialized in texts that demonstrate knowledge and difficulties that are independent of the education level. Therefore, in the situation we investigated, there are more similarities than differences between undergraduate research programs in both high school and higher education, especially when it comes to training aspects, although the projects develop in different settings.

▪ KEYWORDS: literacy; academic literacy; undergraduate research project; high school; higher education.

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Introduction

The provision of quality education presupposes that students are provided with knowledge that allows, on the one hand, academic growth and, on the other hand, their social insertion, by understanding the world in which they live and acting in (and on) it as citizens. This training, in higher education, aims at integrating teaching, research, and extension activities; in basic education, specifically in high school, it is traditionally achieved by educational activities, although there are training activities under the extension and research scope, more precisely regarding scientific research, with development programs and scientific events directed to this public.

Official documents define guidelines for science education policies at these different levels of education. In addition, educational institutions and research funding institutions develop and finance undergraduate research programs that focus on these different audiences, such as the National Council for Scientific and Technological Development (CNPq), through CNPq's Institutional Undergraduate Research Scholarship Program for High School (PIBIC-EM/CNPq) and CNPq's Institutional Undergraduate Research Scholarship Program (PIBIC/CNPq).

Studies on undergraduate research programs in different contexts have already been published in the specialized literature. For instance, we highlight the following studies: Amâncio, Queiroz and Amâncio Filho (1999), Ferreira, C. (2010), Giorgi and Almeida (2018) and Leite (2020), for high school; and Calazans (2002), Demo (2004), Massi (2008) and Massi and Queiroz (2015), for higher education. Investigations that seek to establish comparisons between the two environments are scarcer and, therefore, highly needed. Oliveira and Bianchetti (2018) draw a parallel between the institutionalization of undergraduate research programs for high school and higher education, historicizing the evolution of public educational policies that have guided and followed these programs over the years, highlighting, especially, the offer of scholarships. Our work also establishes relationships between these two contexts, but seeks to establish them from the point of view of principles, guidelines, actions, and training processes that constitute these programs (taking into account their peculiarities), according to how they are conceived and practiced as an educational action by research in the promotion of an academic formation.

Some other studies infer, but do not directly address, similarities or differences between both contexts. Marques and Silva (2006) argue that undergraduate research programs in high school should be implemented in the same way as higher education. Similarly, Heck *et al.* (2012) state that undergraduate research programs in high school provide students with knowledge similar to that of undergraduate students. Ferreira, M. (2010), on the other hand, argues that undergraduate research programs in each environment should be considered as a different training process, since students in higher education are at another stage of their lives, after they have already made their first professional choice.

To fill this gap and try to settle this stir, this work[1] aims at comparatively analyzing the undergraduate research program in basic and higher education, regarding its principles and guidelines recommended in the official documents, and the training aspects that are perceived from language actions resulting from the development of the projects. We consider undergraduate research programs, at the same time, as an action of scientific education through research, considered as a scientific and educational principle, and mainly a set of events and practices of academic literacy. For data collection, we selected two federal public educational institutions, one that offers high school education and another one that offers higher education. We selected official documents dealing with their undergraduate research program guidelines and actions, as well as research reports developed with students from both levels of education.

Our article, thus, is structured as follows: initially, we present the theoretical foundation, with reflections on education through research and studies on literacy and academic literacy; next, we describe the methods and procedures for obtaining and analyzing the data (official documents and reports); later, we proceed to the interpretation of the data; finally, we weave our conclusions.

Education through research

The concept of education through research that we follow comes from the work of Demo (2011a, 2011b, 2012), by outlining methodological paradigms and postures based on investigative, reflective and questioning attitudes in the teaching and learning process. This view is more broadly consistent with the perspective of scientific education, which, having research as a key element, strives for the development of a scientific attitude in students throughout their schooling.

We start from a conception of science in a broad sense, according to Chassot (2003) and the UNESCO (2005), to encompass all fields of science, as a form of language constructed by humans with the objective of understanding nature and society. So, when we refer to science education, we are referring, according to the reflections of Poitman (2005), to the development of the ability to solve problems and take position on issues of social and natural world, placing research and science as more constant practices in the school universe. Thus, we seek to build an educational practice that, based on different types of knowledge – from those most decisively focused on formal education to those related to interpersonal relationships and human activity in the world –, becomes an instrument of emancipation and the constitution of a critical and socially active being.

In Demo's perspective (2011a, 2011b, 2012), research training can be understood in two dimensions: an educational and a scientific one, both inseparable. The first

[1] We emphasize that this work is in line with investigations developed by us in the context of UNITWIN Network / UNESCO MECEAL Chair: Reading and Writing, which aim to analyze literacy practices in the academic domain in different disciplinary contexts, in order to understand the process of construction of scientific knowledge from the central role of language interactions.

dimension, according to the author, starts from the following principles: research, with formal and political quality, creativity and criticality, is the basis of school and university education; the essence of the research is the posture of reconstructive questioning; it must be conceived and valued as an everyday attitude; it is necessary to practice research aiming at the human formation of the students, providing them with knowledge that enables them to know how to think and act in the most different social spheres, with awareness, responsibility, ethics and solidarity. The second, on the other hand, recommends respecting the technical and logical procedures for the construction of knowledge, calling attention to the care with theory as an explanatory and argumentative construction, the relationship between theory and practice, the construction of interpretations for social or natural reality and development skills of writing texts that circulate in the academic environment, aiming at the production and socialization of knowledge.

In line with this orientation, the main objective of the proposal of education through research is the development of what Demo (2011a, 2011b, 2012) calls formal and political competence. By formal competence, he refers to the acquisition of knowledge related to the scientific and technological domain, such as the formation of scientific concepts, the domain of theory and research methods, reading skills and the production of texts (oral and written) from academic nature. By political competence, the author understands the formation of individuals as citizens. In this case, he points out that research must have clear social interests, regarding the formation of citizens and their critical conscience, through the construction and socialization of knowledge and an investigative attitude; it needs to be articulated with practice and aim to face problems and social inequalities, since it is inserted in a broader process of questioning, interpreting reality and responsible intervention.

One of the forms of education through research are the undergraduate research programs. As the name reveals, they are a practice of progressive introduction of students in the scientific activities in a given field of science, through interaction with other partners and their participation, even if peripheral, in the institutional places of production and socialization of scientific knowledge. This key role of research in educational and scientific training is also mentioned by Massi and Queiroz (2015, p.8, our translation): "[…] URP [undergraduate research program] represents a successful experience in complementing the academic and personal training of the university student and conducting to research and professional training […]"[2]. The authors thus emphasize several training dimensions of undergraduate research programs: academic, personal and professional.

In Brazilian university context, Massi and Queiroz (2015) state that the first practices with the characteristics of what would later be called undergraduate research program date from the 1930s, with the foundation of universities with a research ideal.

[2] Original: "[…] *a IC [iniciação científica] representa uma experiência de sucesso na complementação da formação acadêmica e pessoal do universitário e no encaminhamento para a pesquisa e a formação profissional* […]" (MASSI; QUEIROZ, 2015, p.8).

However, it was after the creation, in 1951, of what today is the National Council for Scientific and Technological Development (CNPq) that undergraduate research program in higher education started to be financed. In the 1990s, this funding grew significantly, besides having being expanded more democratically to regions such as the North and Northeast of Brazil.

Some studies (DEMO, 2004; MASSI, 2008; MASSI; QUEIROZ, 2015) circumscribe scientific initiation to higher education. However, in 1986, the Scientific Research Vocation Program (PROVOC) of Fundação Oswaldo Cruz (Fiocruz) appeared in Brazil, which is considered one of the first and most significant experiences of scientific initiation of basic education students in the country. Policies such as this have expanded and received attention from funding research agencies, such as the CNPq, which has three programs for students of basic education in public schools: Undergraduate Research Program for the Brazilian Mathematics Olympiad in Public Schools, Institutional Undergraduate Research Scholarship Program for High School and Senior Undergraduate Research Program.[3]

As we can see, undergraduate research programs, when assuming research as a scientific and educational principle, have been conceived as an action of scientific education at different levels of education. In this process, and reaffirming the understanding of science as language, we consider the fundamental role of language interactions in scientific practice – as highlighted by Demo when mentioning knowledge (skills) related to reading and writing – and, by extension, in human performance in the world. In this sense, we understand that undergraduate research programs can also be seen and studied from the perspective of the uses and meanings of language (notably writing) related to this practice, taking into account the environment or domain in which it occurs, from Literacy Studies and the Academic Literacies approach.

Studies on literacy and academic literacy

Our reflections on literacy are based on the seminal work of Brian Street (1984) and further developments (BARTON; HAMILTON; IVANIČ, 2000; KLEIMAN; ASSIS, 2016; STREET, 2014). The basic premise of Street (1984, p. 1), adopted by us, is: "[…] what the particular practices and concepts of reading and writing are for a given society depends upon the context; that they are already embedded in an ideology and cannot be isolated or treated as 'neutral' or merely 'technical'. […]". To account for the study of literacy as a social use and practice, Street (1984) argues that literacy has no benefits or consequences intrinsic to itself and, therefore, autonomous from participants and institutions in which reading and writing take place. On the contrary, it is advocated

[3] In Portuguese, the programs are: Programa de Iniciação Científica da Olimpíada Brasileira de Matemática das Escolas Públicas, Programa Institucional de Bolsas de Iniciação Científica para o Ensino Médio e Programa de Iniciação Científica Júnior.

that literacy is situated in different social contexts, with meanings, purposes, values, and power relations specific to each, resulting in varied literacies.

These values, intentions and meanings can be inferred from the unique situations of reading and writing, considered in their physical aspect. In this way, the difference between two fundamental concepts of literacy studies emerges: literacy events and practices. The former designates, in the words of Heath (1982, p. 50), "[…] occasions in which written language is integral to the nature of participations' interactions and their interpretative processes and strategies. […]". It is a unique communicative situation, carried out by participants in a given physical context and mediated by a written text (KLEIMAN; ASSIS, 2016), that is, an episode in which literacy plays a role, which includes the situation of interaction, written material, and verbal interactions around this material (MARINHO, 2010). As it involves dimensions that are observable in situations of written use, it constitutes the most basic unit for capturing and understanding them. The later encompasses the concepts and meanings of these events mediated by reading and writing. According to Street (2000), literacy events are guided, shaped and (re) configured by values, beliefs, ideologies, social models, identities, and attitudes. Thus, the practices account for the meanings constructed by the participants for the events, from the cultural and institutional context in which reading and writing are situated. They are, therefore, closely related concepts.

In order to better characterize literacy events and practices, Hamilton (2000) presents their constituent elements. The events would be formed by: participants who interact with writing; physical environment in which this interaction occurs; artifacts (for example, texts) that are involved in the interaction; and activities, or actions, performed by the participants. The practices, on the other hand, would have the following elements: hidden participants (people or groups) involved in social relations with the use of writing; a domain that builds the meaning and purpose of that use; non-material resources, such as knowledge, concepts, feelings, and values; routines and rules that regulate and legitimize actions, as well as define the criteria for participation and knowledge appropriation. The practices, thus, represent the set of events conformed to certain social patterns whose meanings are recognized by the participants.

In this paper, among the various forms of literacy, we address events and practices in the academic domain, through an approach called Academic Literacies, which has its fundamental bases in the works of Lea and Street (1998, 2000, 2014). Regarding the choice of the term that best characterizes this form of literacy and its scope, Lea and Street (2014, p.477, our translation) state: "although the term 'academic literacies' was originally developed with a view to studying literacies at a higher level, the concept also applies to the period from pre-school to high school […]"[4]. Carvalho (2014, p.14, our translation) also defends the "[…] view of academic literacy as an issue that cannot be confined to higher education, it must before be seen throughout the student's entire

[4] Original: "[...] *embora o termo 'letramentos acadêmicos' tenha sido originalmente desenvolvido visando ao estudo de letramentos em nível superior, o conceito também se aplica ao período da pré-escola ao ensino médio* […]" (LEA; STREET, 2014, p.477).

school career […]"[5]. Therefore, it is both a theoretical approach and a concept that can be applied to the two contexts studied in this paper, according to the nature of the events and practices most suited to undergraduate research program.[6]

In a seminal work referring to this area of study, Lea and Street (1998) present us with the definition of academic literacy:

> Academic literacy practices – reading and writing within disciplines – constitute central processes through which students learn new subjects and develop their knowledge about new areas of study. A practices approach to literacy takes account of the cultural and contextual component of writing and reading practices, and this in turn has important implications for an understanding of student learning.

In this excerpt, the authors defend the need to understand the uses of writing in the academic field in two ways: on the one hand, by establishing themselves in a particular domain of language functioning, with its rules, genres, themes, and participants; on the other, for mobilizing even more specific knowledge, since each area of knowledge (subject) has its own conventions, hence the denomination *academic literacies* (in the plural). Thus, academic literacy practices are characterized by demanding not only new knowledge about subjects or contents, but also about understanding cultural issues that permeate writing and reading in different subjects.

In order to analyze academic reading and writing practices, it is necessary to take into account aspects of the institutional context, related to epistemologies, conventions, values, and conceptions that guide individuals' actions, as well as the knowledge they involve and their appropriation process. In this case, it is necessary to consider the materiality that defines the text, as a mediator and marker of the literacy event, as well as the settings of literacy practices historically and culturally constructed in the interactions, which establish the institutional norms, the participants, and their roles, acting in the definition of the form and function assumed by the text in these practices.

We thus perceive the established character of academic literacy practices and the texts that mediate them. The uses of reading and writing occur in social contexts and should be studied as such, in order to understand their functions and meanings within these specific situations. Consequently, the familiarization of new participants with this environment and its conventions is neither a natural nor an automatic process, but requires a process of interaction and integration, via training procedures.

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[5] Original: "[…] *visão da literacia [letramento] académica como uma questão que não pode ser circunscrita ao ensino superior, tem antes de ser perspetivada ao longo de todo o percurso escolar do aluno* […]" (CARVALHO, 2014, p.14).

[6] We recognize, however, that there is no consensus on the use of the term *academic literacy* to name such practices in basic education. Even when referring to higher education, there is an oscillation between the use of terms such as *academic literacy*, *scientific literacy* and *academic-scientific literacy*.

Constitution of the *corpus* and analysis procedures

In order to compare the undergraduate research program of high school and higher education students, we highlight elements of academic literacy events and practices in two federal public education institutions between the years 2015 and 2017: Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Norte (IFRN), referring to high school[7]; and Universidade Federal da Paraíba (UFPB), referring to higher education. The selection criterion for the two institutions was based on our practice there as teachers and supervisors of undergraduate research program, knowing and undergoing such experiences.

Based on the principle that literacies are mediated by texts, we selected a set of documents referring to institutional norms and effective practices of undergraduate research programs in both contexts, also with the objective of assessing the degree of equivalence between them. We adopted as criteria for the definition of documents: the presence of thematization, normatization or registration aspects of undergraduate research programs; besides their degree of correspondence. As a result of this process, we elected the following documents, grouping them by correspondence between the two levels, for comparative effect:

1. National Education Guidelines and Framework Law (LDB), for both levels;
2. Brazil's National Common Curricular Base (BNCC) and National Curricular Guidelines for High School Technical Vocational Education, for high school, and National Curricular Guidelines for Initial and Continuing Education at Higher Education of Basic Education Teaching Professionals[8], for higher education;
3. IFRN's Political Pedagogical Project (PPP) and UFPB's Institutional Pedagogical Project (IPP)[9];
4. Two IFRN undergraduate research program announcements (years 2015 and 2016) and two UFPB undergraduate research program announcements (years 2016 and 2017), defined according to the research whose reports we studied;

[7] Although we are aware that the federal institutes of education, science and technology, according to Law nº 11.892/2008 (BRASIL, 2008), are entities able to act in different levels and modalities of education (basic, professional education, and even undergraduate and postgraduate levels), with implications on institutional, pedagogical and financial issues, we address only aspects related to high school, in line with our thematic focus.

[8] The choice of this document is due to the area and the higher level course to which the research reports analyzed belong.

[9] We consider the IPP from 2014 to 2018, comprising the period stipulated for the constitution of the data. In Portuguese, the documents are Projeto Político-Pedagógico (PPP) do IFRN and Projeto Pedagógico Institucional (PPI) da UFPB.

5. Two final research reports resulting from the selected announcements, in the area of Linguistics and Literature[10], at IFRN, and two final research reports resulting from the selected announcements, also in the area of Linguistics and Literature, at UFPB.

Thus, we have two sets of data referring to undergraduate research programs aimed at both student profiles. At first, we analyzed official documents that determine the guidelines, policies and undergraduate research program actions for both offers, in addition to CNPq announcements aimed at high school and higher education. With this, we hope to understand the institutional conceptions and objectives of each level of education regarding their science education policy, in addition to rules that define the individual's profile and form of participation. Next, we analyzed final research reports on projects at both levels, resulting from these aforementioned announcements. The reports are coded as R1-EM (Report 1 - High School), R2-EM (Report 2 - High School), R3-ES (Report 3 - Higher Education) and R4-ES (Report 4 - Higher Education). Thus, we seek to understand activities that are reported and define routines of knowledge construction, reading and writing practices, as well as genres experienced in this process, in addition to the resulting product in training terms, regarding the acquisition of knowledge about scientific practice, contents and rules of the disciplinary field.

Undergraduate research projects in official documents

Official documents have the function of establishing, at the national or institutional level, science education policies (notably undergraduate research programs) and determining their parameters. In this sense, they constitute artifacts that found conceptions, objectives, rules and actions to guide undergraduate research and, therefore, are part of the elements that make up events and academic literacy practices.

In a more general scope, we have Law No. 9,394, of December 20, 1996, which defines the National Education Guidelines and Framework Law (LDB) (BRASIL, 1996). Among the principles and purposes of national education for all levels, stages and modalities of teaching, LDB points out "freedom to learn, teach, research and disseminate culture, thought, art and knowledge" (BRASIL, 1996, our translation).[11] In the same direction, it lists, as one of the duties of the State, to guarantee "access to the highest levels of education, research and artistic creation, according to the capacity of each one" (BRASIL, 1996, our translation).[12]

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[10] The definition of the area of Linguistics and Literature, in both contexts, is due to our training and teaching practice, so that we can better interpret the literacy practices in this disciplinary field and offer subsidies to our own performance and, by extension, to other colleagues of the field.

[11] Original: "[...] *liberdade de aprender, ensinar, pesquisar e divulgar a cultura, o pensamento, a arte e o saber*" (BRASIL, 1996).

[12] Original: "[...] *acesso aos níveis mais elevados do ensino, da pesquisa e da criação artística, segundo a capacidade de cada um*" (BRASIL, 1996).

When referring to the purpose of each level of education, the document is more generic when it comes to basic education. For the purposes of high school, for example, it addresses the "development of intellectual autonomy and critical thinking",[13] as well as "the understanding of the scientific-technological foundations of productive processes, relating theory to practice, in the teaching of each course" (BRASIL, 1996, our translation).[14] When it comes to higher education, LDB is quite clear about the importance of research in the students' training path. Among the purposes of higher education, we have:

> I – to stimulate cultural creation and the development of scientific spirit and reflective thinking;
>
> .....
>
> III – to encourage research and scientific investigation work, aiming at the development of science and technology and the creation and dissemination of culture, and, thus, develop the understanding of man and the environment in which he lives;
>
> IV - to promote the dissemination of cultural, scientific and technical knowledge that constitute the heritage of humanity and to communicate knowledge through teaching, publications or other forms of communication;
>
> .....
>
> VII – to promote extension programs, open to the participation of the population, aiming to spread the achievements and benefits resulting from cultural creation and scientific and technological research generated in the institution.
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> VIII – to act in favor of the universalization and improvement of basic education, through the training and qualification of professionals, the practice of pedagogical research and the development of extension activities that bring together the two school levels.[15] (BRASIL, 1996, our translation).

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[13] Original: "[...] *desenvolvimento da autonomia intelectual e do pensamento crítico*" (BRASIL, 1996).

[14] Original: "[...] *a compreensão dos fundamentos científico-tecnológicos dos processos produtivos, relacionando a teoria com a prática, no ensino de cada disciplina*" (BRASIL, 1996).

[15] Original: "I - *estimular a criação cultural e o desenvolvimento do espírito científico e do pensamento reflexivo;*
.....
III - incentivar o trabalho de pesquisa e investigação científica, visando o desenvolvimento da ciência e da tecnologia e da criação e difusão da cultura, e, desse modo, desenvolver o entendimento do homem e do meio em que vive;
IV - promover a divulgação de conhecimentos culturais, científicos e técnicos que constituem patrimônio da humanidade e comunicar o saber através do ensino, de publicações ou de outras formas de comunicação;
.....

LDB also mentions research at universities when addressing its duties, such as "establishing plans, programs and scientific research projects" (BRASIL, 1996, our translation),[16] and the financial resources to develop such activities. It is evident, therefore, that the document chooses the university as an environment *par excellence* for research, defining, for that, institutional rules regarding the purposes, attributions and forms of financing.

In relation to documents of national scope that are specific to each level of education, there are references to scientific practice and undergraduate research programs.

In the context of basic education, particularly high school education, the National Common Curricular Base (BRASIL, 2018) does not specifically address undergraduate research programs, which is our object of investigation, although it mentions activities, artifacts and knowledge related to literacy practices in academic domain. When dealing with study and research practices in the Portuguese Language curricular component, the document mentions the development of skills and knowledge related to scientific doing in the teaching dimension, therefore, the conception of research as a scientific and educational principle: research techniques; data collection and analysis procedures; and characteristics of scientific and scientific dissemination genres, such as final paper, essay, scientific article, encyclopedia entry, infographic, experiment report, report, scientific report, oral presentation, seminar, round-table communication, etc.

The National Curricular Guidelines for High School Technical Vocational Education,[17] on the other hand, explicitly elect research as a pedagogical principle (in its educational and scientific dimension) one of their foundations. According to CNE/CEB Resolution 11/2012:

> High School Technical Vocational Education should be conceived as an opportunity for integral human formation, having as a structuring axis the integration between work, science, technology and culture, based on work as an educational principle, on research as a pedagogical principle and on permanent articulation with socioeconomic development, to guarantee working citizens the opportunity to exercise their citizenship with dignity and social justice.[18] (BRASIL, 2013, p.38, our translation).

VII - promover a extensão, aberta à participação da população, visando à difusão das conquistas e benefícios resultantes da criação cultural e da pesquisa científica e tecnológica geradas na instituição.
VIII - atuar em favor da universalização e do aprimoramento da educação básica, mediante a formação e a capacitação de profissionais, a realização de pesquisas pedagógicas e o desenvolvimento de atividades de extensão que aproximem os dois níveis escolares." (BRASIL, 1996).

16 Original: "[...] *estabelecer planos, programas e projetos de pesquisa científica*" (BRASIL, 1996).

17 New national curriculum guidelines for professional and technological education are in the process of being built. Until the closing of this paper, they had already been approved by the National Education Council (CNE), but await approval by the Ministry of Education (MEC), therefore, they are not yet in force. For this reason, we consider the 2012 guidelines, now in force.

18 Original: "[...] *a Educação Profissional Técnica de Nível Médio deve ser concebida como oportunidade para a formação humana integral, tendo como eixo estruturante a integração entre trabalho, ciência, tecnologia e cultura, fundamentando-se no trabalho como princípio educativo, na pesquisa como princípio pedagógico e na permanente*

Based on this guidance, draft Resolution nº 6, of September 20, 2012, which institutes the guidelines, textually mentions undergraduate research program as an action of education through research in the basic education environment:

> Art. 14 The syllabus of the High School Technical Vocational Education courses should provide students with:
>
> […]
>
> VI – fundamentals of entrepreneurship, cooperativism, information technology, labor legislation, professional ethics, environmental management, work safety, innovation management and undergraduate research program, people management and management of the social and environmental quality of work.[19] (BRASIL, 2013, p.60-61, our translation).

In this perspective, high school technical vocational education should provide students with an understanding of scientific foundations and innovation and undergraduate research programs, related to their professional training. Among its fundamental principles are: integral human formation, that is, general and professional, through the articulation of the dimensions of culture, work, science and technology, and their contextualization; and research as a pedagogical principle. According to CEB Resolution nº 5/2011, the research:

> […] instigates the student in the sense of curiosity towards the world around him, generates anxiety, allowing the student to be a protagonist in the search for information and knowledge, whether of common sense, school or scientific knowledge.
>
> This attitude of uneasiness in the face of the reality enhanced by research, when awakened in high school, contributes so that the student can individually and collectively formulate research questions and seek answers in an autonomous process of (re)construction of knowledge. In this sense, the relevance is not in the provision of information by the teacher, which, nowadays, is found, most of the time and in a wide and diversified way, outside of classes and even at school. What is relevant is the development of research capacity, so that students search and (re)

articulação com o desenvolvimento socioeconômico, para garantir ao cidadão trabalhador a oportunidade de exercer sua cidadania com dignidade e justiça social." (BRASIL, 2013, p.38).

[19] Original: "Art. 14 *Os currículos dos cursos de Educação Profissional Técnica de Nível Médio devem proporcionar aos estudantes*:
[…]
VI – *fundamentos de empreendedorismo, cooperativismo, tecnologia da informação, legislação trabalhista, ética profissional, gestão ambiental, segurança do trabalho, gestão da inovação e iniciação científica, gestão de pessoas e gestão da qualidade social e ambiental do trabalho*." (BRASIL, 2013, p.60-61).

> build knowledge.[20] (BRASIL, 2012 *apud* BRASIL, 2013, p.218, our translation).

Similarly, the National Curricular Guidelines for Initial and Continuing Education at Higher Education of Basic Education Teaching Professionals (BRASIL, 2015), within the scope of higher education in the area of Teaching License in Portuguese Language, advocate as one of its basic principles the inseparability between teaching, research and extension, considering research and extension as pedagogical principles essential to educational practice and professional development, as elements to contribute to the academic quality of university education offered. In this sense, CNE Resolution 2/2015 (BRASIL, 2015) warns of the impoverishment of students' training when research and extension are neglected.

Regarding research, the Resolution characterizes it as "[…] cognitive and training principle and, therefore, the core axis of this formation […]"[21] (BRASIL, 2015, p.7, our translation). Based on these foundations, the curricular guidelines point to undergraduate research programs as a theoretical-practical activity that can compose the training itinerary of the course, within the scope of integrative studies for curriculum enrichment. As a result of these actions of researching, building and socializing knowledge, students are expected to apprehend knowledge related to scientific practice, specifically related:

> II - to the construction of knowledge, valuing research and extension as pedagogical principles essential to the exercise and improvement of the teaching profession and the improvement of educational practice;
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> III – to the access to national and international research sources, to good quality pedagogical support material, to study time and academic-professional production, enabling programs to encourage research on basic education[22] (BRASIL, 2015, p.24, our translation).

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[20] Original: "[…] *instiga o estudante no sentido da curiosidade em direção ao mundo que o cerca, gera inquietude, possibilitando que o estudante possa ser protagonista na busca de informações e de saberes, quer sejam do senso comum, escolares ou científicos.*
Essa atitude de inquietação diante da realidade potencializada pela pesquisa, quando despertada no Ensino Médio, contribui para que o sujeito possa, individual e coletivamente, formular questões de investigação e buscar respostas em um processo autônomo de (re)construção de conhecimentos. Nesse sentido, a relevância não está no fornecimento pelo docente de informações, as quais, na atualidade, são encontradas, no mais das vezes e de forma ampla e diversificada, fora das aulas e, mesmo, da escola. O relevante é o desenvolvimento da capacidade de pesquisa, para que os estudantes busquem e (re)construam conhecimentos." (BRASIL, 2012 apud BRASIL, 2013, p.218).

[21] Original: "[…] *princípio cognitivo e formativo e, portanto, eixo nucleador dessa formação*. […]" (BRASIL, 2015, p.7).

[22] Original: "II - *à construção do conhecimento, valorizando a pesquisa e a extensão como princípios pedagógicos essenciais ao exercício e aprimoramento do profissional do magistério e ao aperfeiçoamento da prática educativa*;
III - *ao acesso às fontes nacionais e internacionais de pesquisa, ao material de apoio pedagógico de qualidade, ao tempo de estudo e produção acadêmica-profissional, viabilizando os programas de fomento à pesquisa sobre a educação básica"* (BRASIL, 2015, p.24).

As we can see, the guidelines for both offers mainly highlight conceptions and skills related to science education: they are based on the conception of research as a pedagogical principle (scientific and educational), based on Demo's reflections (2011a, 2011b, 2012), in order to provide students with knowledge that implies formal and political quality training. The higher education guidelines, however, point more strongly to the inseparability between teaching, research and extension in university education, in line with the provisions of LDB. These conceptions underpin the science education policies and actions listed in the educational projects of the two institutions for their respective offers.

IFRN's Political Pedagogical Project (PPP) (INSTITUTO FEDERAL DE EDUCAÇÃO, CIÊNCIA E TECNOLOGIA DO RIO GRANDE DO NORTE, 2012, p.27, our translation) includes among the characteristics and purposes of the institution:

> […] e) to become a center of excellence in the provision of science education in general, and applied science in particular, stimulating the development of a critical, reflective and research-oriented spirit;
>
> .....
>
> g) to develop extension and scientific and technological dissemination programs;
>
> h) to conduct and stimulate scientific and technological research, cultural production and technological innovation;
>
> i) to encourage cooperativism and scientific and technological development; and
>
> j) to promote the production, development and transfer of technologies, notably those aimed at environmental sustainability and society's demands.[23]

These items directly reflect the postulates of research as a scientific and educational principle: development of an investigative, critical and reflective attitude; production of scientific and technological knowledge with formal and political quality; and dissemination of the knowledge produced aiming at the benefit of society.

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[23] Original: "[…] e) *constituir-se em centro de excelência na oferta do ensino de ciências, em geral, e de ciências aplicadas, em particular, estimulando o desenvolvimento de espírito crítico, reflexivo e voltado à pesquisa*;
.....
g) *desenvolver programas de extensão e de divulgação científica e tecnológica*;
h) *realizar e estimular a pesquisa científica e tecnológica, a produção cultural e a inovação tecnológica*;
i) *estimular o cooperativismo e o desenvolvimento científico e tecnológico; e*
j) *promover a produção, o desenvolvimento e a transferência de tecnologias, notadamente as voltadas à sustentabilidade ambiental e às demandas da sociedade*." (INSTITUTO FEDERAL DE EDUCAÇÃO, CIÊNCIA E TECNOLOGIA DO RIO GRANDE DO NORTE, 2012, p.27).

In order to achieve these principles and concepts, the policy and actions in the scope of research and innovation, according to the PPP (INSTITUTO FEDERAL DE EDUCAÇÃO, CIÊNCIA E TECNOLOGIA DO RIO GRANDE DO NORTE, 2012), seeks to the training of future researchers, providing them with: human and academic-scientific training; cultivation, production, socialization and dissemination of knowledge; relationship between education, science and technology; and social development. The document also points out that this training must be stimulated and carried out systematically in all educational offerings (basic education, undergraduate and graduate courses), that is, "[…] transiting through all IFRN training environments […]"[24], aiming at "[…] the academic-scientific training of the social actors involved"[25] (INSTITUTO FEDERAL DE EDUCAÇÃO, CIÊNCIA E TECNOLOGIA DO RIO GRANDE DO NORTE, 2012, p. 195, our translation).

In UFPB's Institutional Pedagogical Project (IPP) (UNIVERSIDADE FEDERAL DA PARAÍBA, 2014), this integration is also present, covering all of its teaching offerings - basic education, undergraduate and graduate courses. In its policy of scientific and technological research, it aims at high qualification, which can also contribute to sustainable development, with actions on the informal labor market and with education, in general, as noted in the following excerpt:

> Scientific and Technological Undergraduate research Programs and Academic Programs are one of the strategies for expanding and improving undergraduate education in the effective perspective of reducing dropout, failure, and leave of absence rates. In this sense, academic scholarships are evident through PIBIC, PIBIC-Af, PIBITI and Young Talents for Science etc. for student support, as well as sandwich exchange programs with the Science Without Borders Program.[26] (UNIVERSIDADE FEDERAL DA PARAÍBA, 2014, p.21, our translation).

For these purposes, it develops undergraduate research programs specific to the institution, as well as in partnership with development agencies, such as CNPq, covering undergraduate and high school students. Regarding the results of Undergraduate research Programs in what refers to undergraduate students, the IPP points out that more than 70% enter *stricto sensu* postgraduate courses, with an average degree time lower than those who did not participate in such programs.

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[24] Original: "[…] *transitando por todos os ambientes formativos do IFRN* […]" (INSTITUTO FEDERAL DE EDUCAÇÃO, CIÊNCIA E TECNOLOGIA DO RIO GRANDE DO NORTE, 2012, p.195).

[25] Original: "[…] *à formação acadêmico-científica dos atores sociais envolvidos*" (INSTITUTO FEDERAL DE EDUCAÇÃO, CIÊNCIA E TECNOLOGIA DO RIO GRANDE DO NORTE, 2012, p.195).

[26] Original: "*Os Programas de Iniciação Científica e Tecnológica e os Programas Acadêmicos constituem-se uma das estratégias de expansão e de melhoria do ensino de graduação na perspectiva efetiva da redução das taxas de evasão, retenção e trancamento total. Nesse sentido, evidenciam-se as bolsas acadêmicas através do PIBIC, PIBIC-Af, PIBITI e Jovens Talentos para a Ciência etc. para apoio aos alunos, bem como o intercâmbio de Graduação sanduíche com o Programa Ciência sem Fronteiras*." (UNIVERSIDADE FEDERAL DA PARAÍBA, 2014, p.21).

Both institutions focus on research as an action that favors the acquisition of knowledge about scientific practice, as well as critical sense, capacity for questioning and responsible action in the world. Among the characteristics that are more focused on higher education, elements focusing on the profile of the participants stand out: contribution to increase rates of permanence and approval in graduation, as well as direction to the post-graduation, acting, thus, in the formation of (future) human resources for research.

Among the undergraduate research programs developed at IFRN that count on the participation of high school students as scholarship holders or volunteers, we highlight CNPq's Institutional Undergraduate Research Scholarship Program for High School (PIBIC-EM/CNPq), although there are two others that allow the participation of both high school and higher education students: the Institutional Research Support Program - Development of Research Projects, in two modalities, one with funding and the other with continuous flow, without funding.

At IFRN, PIBIC-EM/CNPq is intended exclusively for high school integrated with technical professional education.[27] Its objectives at the Institute are, according to the public announcements (INSTITUTO FEDERAL DE EDUCAÇÃO, CIÊNCIA E TECNOLOGIA DO RIO GRANDE DO NORTE, 2015, 2016): to awaken the scientific vocation of employees and students of the institution; to involve students in research and innovation activities, so that they can develop the knowledge, values and attitudes necessary for science education; and consolidate research and innovation at the Institute, producing and socializing knowledge.

Among the requirements and commitments/duties of the program participants, we highlight, according to the public notices:

1. For students: be enrolled in high school; not have an employment contract or receiving another type of scholarship; have updated curriculum Lattes; have a school performance equal to or higher than the Institute's average; present their production at seminars / events; participate in the program's monitoring seminars; and submit a partial and final report;
2. For guiding teachers: be a permanent professor at the institution; be affiliated to a research center / group certified by the institution; have at least the master's degree; have experience with the training of human resources; have a minimum workload of four hours a week to guide the fellow; not have a pending research project developed at the institution (rule valid from 2016); monitor the activities of the fellow, as well as compliance with the weekly workload; and fill in the documents for monitoring the project's execution.

[27] A The forms and modalities of offering highs school technical vocational are as follows: linked to high school education, in a concomitant and integrated way, both in the regular modality and in the education of young people and adults; and subsequent to high school. Of these, the IFRN does not only offer the concomitant linked form.

The projects must contain two participants: a student, to whom is paid R$ 100.00 (one hundred Brazilian *reais*) per month; and a teacher, a volunteer. The items evaluated in the proposal selection process are: research project, academic production of the proposing teacher and academic performance of the scholarship student. The period of execution of the projects is 12 months.

At UFPB, the undergraduate research programs for higher education students are: CNPq's Institutional Undergraduate Research Scholarship Program (PIBIC/CNPq), Institutional Undergraduate Research Scholarships in Technological Development and Innovation (PIBITI/CNPq), Institutional Program of Undergraduate Research Scholarships in Affirmative Actions (PIBIC-AF/CNPq), Undergraduate Research Volunteers Institutional Program (PIVIC/UFPB) and UFPB's Institutional Undergraduate Research Scholarships Program (PIBIC/UFPB), all of them launched in a single call for submissions. Their objectives are, according to the public announcements (UNIVERSIDADE FEDERAL DA PARAÍBA, 2016, 2017): to develop scientific vocation, to encourage talents for research and to provide academic-scientific training.

Among the requirements and commitments/duties of the participants, as stipulated in the public announcements, we highlight:

1. For students: be enrolled in an undergraduate course; have good academic performance; have updated curriculum Lattes; fulfill the activities and the proposed workload; not participate in another institutional program or have an employment contract; prepare a partial and final report of the research; present the results of the research at a university undergraduate research program event;
2. For advisors: be exercising full research activity; have a PhD; be a university teacher, technical-administrative (member of a postgraduate program, from 2017 announcement on), visiting university teacher or retired university teacher who is a volunteer (in the case of PIVIC, the advisor can be a master, a requirement present in 2016 announcement but prohibited in 2017, or postdoctoral at the institution); be registered in a research group; guide students through the different stages of the project; prove the production resulting from the projects; participate in the activities requested as a result of his/her role as project coordinator; manage research; submit partial and final reports.

Each researcher can guide a maximum of five students, two of them with scholarships, if contemplated, whose value is R$ 400.00 (four hundred Brazilian *reais*) per month. The items evaluated in the proposals are: curriculum, project, work plan, and other documents from competent agencies, when applicable (for example, the approval of the project by a research ethics committee). The projects are expected to last 12 months.

The announcements mention, in general, the same elements: objectives, rules of participation, profile of participants and activities. The objectives and activities are similar, and there are no major differences in the student's profile - except, of course, in the level of education. In higher education, however, there are more restrictions on the profile of supervisors (requiring higher degrees) and, what is more important, greater investment of human and financial resources, materialized in the greater variety of undergraduate research program programs, in the larger number of participants and scholarships per project and the value of the scholarship per student.

The training aspects materialized in the reports

The consultation of the final reports of research carried out in high school and higher education allowed us to identify, regarding the process of knowledge construction, a series of activities that are configured in different stages, such as the construction of a theoretical framework, data generation, data analysis and publicizing the results. In this article, we highlight the presentation of these steps and the interpretation of excerpts corresponding to some of them, with emphasis on the theoretical framework and data analysis, which are the biggest in three of the four reports (the exception is R1-EM, which is an activity report, reason why it does not proceed with the construction of a theoretical framework or data analysis).

Regarding the steps listed in the reports, we show these two examples:

Example 1 – R1-EM[28]

> This bibliographic research started from the reading, interpretation and analysis of a cataloged and studied novel since its release in 1932. The basic text of José Lins do Rego led us to other theoretical readings with which we will analyze the corpus - Menino de Engenho - in the light of our goal. […]
> .....
> The construction of knowledge through the bibliographic research performed here, we considered the reading effectiveness of the subjects, since we are the readers who find in the written lines the means that are appropriate to scientific practice. Knowledge gained even more precise guidelines when we started from sufficiently verified data of a general truth not yet completely contained in the examined object, but which, from what already existed, reached more specific conclusions. […]
> .....
> From the proposal of this investigation that starts from the reading of the aforementioned work, we propose a far-reaching theoretical review that served as input for the categories of analysis in question.

Source: authors' elaboration (our translation).

[28] Original: *"Esta pesquisa bibliográfica partiu da leitura, interpretação e análise de um romance catalogado e estudado desde o seu lançamento em 1932. O texto base de José Lins do Rego nos conduziu a outras leituras teóricas com as quais analisaremos o corpus – Menino de Engenho – à luz do nosso objetivo*. […]
.....
A construção do conhecimento por intermédio da pesquisa bibliográfica aqui executada, apropriou-se da eficácia leitora dos sujeitos, já que somos nós leitores que encontramos nas linhas escritas o meio propício a um fazer

Example 2 – R3-ES[29]

The discussed proposal consists of the following methodological procedures to achieve the planned goals: a literature review, through study meetings and debates to deepen the issues in question, addressing the main concepts to be used in the analyzes, which refer to the content of Portuguese language classes in high school; selection, description and analysis of the corpus researched in classrooms; preparation of articles for the dissemination of research as well as participation of members involved in regional and national scientific events; making partial and final reports; participation in scientific events, including international ones.

Source: authors' elaboration (our translation).

R1-EM section is part of the methodological section of the report; R3-ES is part of the introduction. Both of them list almost identical stages of project execution (which is also repeated in R2-EM and R4-ES), which are very similar to the dynamics of formal construction of scientific knowledge through research (DEMO, 2012): the process starts with a theme or hypothesis, studied according to a theory(s) and method, and lead to certain results and conclusions to be socialized, in a trajectory that goes from the interpretation of the knowledge already produced to the construction and own elaboration. Each of these phases suggests events/practices in which participants interact with a range of genres (artifacts) in reading/listening and in production, some textually cited (literary work as corpus; scientific article, and report as publication of results), others inferable through the activities that they regularly mediate (for example, the reading of texts for the construction of theoretical references takes us to genres such as scientific article, dissertation, thesis, individual final paper about a book). Despite this indication, R1-EM does not present, for example, a theoretical reference section, although it is included as attachments to files of texts studied in this stage of the research.

Another similarity between the two sections is about the knowledge related to scientific practice. On the one hand, the reports demonstrate that the team was able to experience (and eventually learn about) different stages of research execution and, consequently, of the formal process of building scientific knowledge. On the other hand, they also show difficulty in differentiating the research steps (stages) of the

científico. O conhecimento ganhou nortes ainda mais precisos quando partimos de dados suficientemente constatados de uma verdade geral ainda não contida completamente no objeto examinado, mas que a partir do que já existia, chegou-se a conclusões mais específicas. [...]

.....

A partir da proposta desta investigação que parte da leitura da supracitada obra, propomos uma rebuscada revisão teórica que serviu de aporte para as categorias de análise em questão."

[29] Original: "*A proposta discutida constitui-se dos seguintes procedimentos metodológicos para realizar as metas planejadas: uma revisão da literatura, por meio de reuniões de estudos e debates para o aprofundamento dos temas em questão, abordando os principais conceitos a serem utilizados nas análises, os quais dizem respeito ao conteúdo das aulas de Língua Portuguesa do Ensino Médio; seleção, descrição e análise do material do corpus pesquisado em salas de aula; elaboração de artigos para divulgação da pesquisa bem como participação dos membros envolvidos em eventos científicos regionais e nacionais; confecção de relatórios parciais e finais; participação em eventos científicos também internacionais*."

methodological procedures for obtaining and analyzing the data. Although the indication is to outline the methodological procedures (which is noticeable by the location of R1-EM fragment in the methodology section and by the announcement of R3-ES that it will enumerate the methodological procedures), the two fragments only situate this action as one of the stages, with general information (and sometimes excessively vague, such as the second paragraph of the text of R1-EM) on the type of research (bibliographic in the first case and field in the second).

The theoretical reference section is present in three of the four reports we analyzed. It is a record (theoretical synthesis) of the main concepts relevant to the research theme, resulting from the practices, listed in the first two examples, of survey, reading and discussion of the specialized literature. Here are two examples:

Example 3 – R2-EM[30]

Communication is a human practice. We develop and improve ways to communicate over time, so that the interaction between each area of human activity and language has become possible. We call textual genre any form, oral and written, that makes this interaction possible.

> [...] The use of language takes place in the form of concrete and unique statements (oral or written), given by members of this or that field of human activity. These statements reflect the specific conditions and purposes of each referred field not only for its (thematic) content and the style of the language, that is, for the selection of the phraseological and grammatical lexical resources of the language, but, above all, for its compositional construction. (BAKHTIN, 2015, p.261).

According to Bakhtin, a genre is characterized as a relatively stable type of statement. It has a compositional structure, in addition to being distinguishable for its content and style, and is also an entity chosen according to the intention of verbal communication. "In this way, every genre is marked by its sphere of action that promotes specific ways of indissolubly combining thematic content, communicative purpose, style and composition" (KOCH; ELIAS, 2009, p.107).
According to Bakhtin (2015), the importance of textual genres is such that, if they did not exist and it was up to us to invent them, developing them in each communicative interaction, it would be practically impossible to communicate verbally.

Source: authors' elaboration (our translation).

[30] Original: "*O ato de se comunicar é algo característico do ser humano. Desenvolvemos e aperfeiçoamos formas de nos comunicar através do tempo, de forma que a interação entre cada área da atividade humana e a linguagem se tornaram possíveis. Chamamos de gênero textual toda forma, oral e escrita, que possibilita essa interação*.

> [...] *O emprego da língua efetua-se em forma de enunciados (orais ou escritos) concretos e únicos, proferidos pelos integrantes desse ou daquele campo da atividade humana. Esses enunciados refletem as condições específicas e as finalidades de cada referido campo não só por seu conteúdo (temático) e pelo estilo da linguagem, ou seja, pela seleção dos recursos lexicais fraseológicos e gramaticais da língua, mas, acima de tudo, por sua construção composicional*. (BAKHITIN, 2015, p.261).

De acordo com Bakhtin, um gênero se caracteriza como um tipo relativamente estável de enunciado. Este possui uma estrutura composicional, além de ser distinguível por seu conteúdo e estilo, sendo também uma entidade escolhida de acordo com a intenção da comunicação verbal. 'Desse modo, todo gênero é marcado por sua esfera de atuação que promove modos específicos de combinar, indissoluvelmente, conteúdo temático, propósito comunicativo, estilo e composição' (KOCH; ELIAS, 2009, p.107).
Segundo Bakhtin (2015), *tamanha é a importância dos gêneros textuais que, caso não existissem e coubesse a nós inventá-los, desenvolvê-los a cada interação comunicativa, seria praticamente impossível comunicar-se verbalmente*."

Example 4 – R4-ES[31]

The study of textual (discursive) genres is not restricted to current days. Since antiquity, studies have been carried out on this subject; names like Plato and Aristotle started discussions about genres. With the evolution of knowledge on the subject, it can be said that, as Marcuschi (2008) points out, there is currently a new vision, studies have been improved and methods have emerged so that the theoretical constructions could be confirmed.
Bakhtin (2011) states that in the past centuries the definition of genre was intrinsic to the discourse, that is, it took into account the verbal nature of the statement; more recently, making use of the point of view of Saussurean studies, of a structuralist nature. Currently, there is a different notion, which takes into account the language in use. In this sense, Marcuschi (2008. p.149,) declares that

> [...] The analysis of the genres includes an analysis of the text and discourse and a description of the language and vision of society, and still tries to answer questions of a socio-cultural nature in the use of the language in general. The treatment of genres concerns the treatment of language in its daily life in the most diverse forms. [...] We can say that genres are a 'form of social action'.

Human communication, whether oral or written, is based on genres. Bakhtin (2011.p.301) ensures that:

> To speak, we always use discourse genres, in other words, all our statements have a standard and relatively stable way of structuring in a way. We have a rich repertoire of oral (and written) speech genres. In practice, we use them safely and expertly, but we can totally ignore their theoretical existence [...].

Bakhtin (2011. p.279) defines genres as relatively stable utterances "Any statement considered in isolation is clear, individual, but each sphere of use of the language elaborates its relatively stable types of utterances, which is what we call speech genres". This definition of genre is based on a conception of language as a socio-historical and cognitive action.

Source: authors' elaboration (our translation).

[31] Original: "*O estudo dos gêneros textuais (discursivos) não é exclusivo dos dias atuais. Desde a Antiguidade estudos eram realizados sobre o referido tema; nomes como Platão e Aristóteles iniciaram as discussões sobre os gêneros. Com a evolução do conhecimento sobre o assunto pode-se afirmar que, como diz Marcuschi (2008), atualmente há uma nova visão, estudos foram se aperfeiçoando e métodos surgindo para que as construções teóricas obtivessem uma comprovação*.
Bakhtin (2011) afirma que nos séculos passados a definição de gênero era intrínseca ao discurso, ou seja, levava-se em consideração a natureza verbal do enunciado; mais recentemente, fazendo-se uso do ponto de vista dos estudos saussurianos, de cunho estruturalista. Atualmente têm-se uma noção diferente, que leva em conta a língua em uso. Nesse sentido, Marcuschi (2008. p.149,) declara que:

> *[...] a análise dos gêneros engloba uma análise do texto e do discurso e uma discrição da língua e visão da sociedade, e ainda tenta responder a questões de natureza sociocultural no uso da língua de maneira geral. O trato dos gêneros diz respeito ao trato da língua em seu cotidiano nas mais diversas formas. [...] podemos dizer que os gêneros são uma 'forma de ação social'.*

A comunicação humana, seja esta oral ou escrita, é feita a partir de gêneros. Bakhtin (2011.p.301) assegura que:

> *Para falar, utilizamo-nos sempre dos gêneros do discurso, em outras palavras, todos os nossos enunciados dispõem de uma forma padrão e relativamente estável de estruturação de um modo. Possuímos um rico repertório dos gêneros do discurso orais (e escrito). Na prática, usamo-los com segurança e destreza, mas podemos ignorar totalmente a sua existência teórica [...].*

Bakhtin (2011. p.279) define os gêneros como tipos relativamente estáveis enunciados 'Qualquer enunciado considerado isoladamente é claro, individual, mas cada esfera de utilização da língua elabora seus tipos relativamente estáveis de enunciados, sendo isso que denominamos gêneros do discurso'. Essa definição de gênero fundamenta-se em uma concepção de língua como ação sóciohistórica e cognitiva."

In both excerpts, the authors discuss the same theme (the discursive/textual genres), integrating their discourse with that of scholars, through paraphrases and, mainly, direct quotations, in a process of reconstruction and re-elaboration of scientific knowledge. In general, the authors try to engage in discursive practices in the field of language studies, insofar as they situate their work in a thematic area and address a subject pertinent to their research, making use of concepts shared by other members of the community and retrieving readings from prestigious scholars in the area.

At the linguistic-discursive level, the authors of the reports also seem to understand the importance of resorting to specialized literature to legitimize their discourse and of making some kind of mention of it, proceeding, even, by following some of the normative aspects of elaboration of citations according to NBR 10520 (ASSOCIAÇÃO BRASILEIRA DE NORMAS TÉCNICAS, 2002). However, we emphasize the prevalence of direct citations, which can configure, according to Boch and Grossmann (2002), better control in the presentation of academic concepts, perhaps due to a certain difficulty in appropriating the ideas of others and paraphrasing them, or, according to Faria (2015), a characteristic that is common in the area of Linguistics and Literature, using quotations (or direct speech, as she calls it) in mentioning what the other says when preparing academic works.

As for the theoretical framework of the other reports, R3-ES follows the same pattern as the examples presented above. R1-EM, on the other hand, does not have such a section: there is only an indication that there was a literature review as one of the stages of project execution.

The analysis and discussion of the data is announced in the four reports, although in R1-EM there is no effective presentation of research results, but only contributions and publications resulting from it. In the others, this step aims to present and discuss the results or build interpretations about the object of study, as we can see in these two excerpts:

Example 5 – R2-EM[32]

Three of the four reports referred to Law nº 11,788, of September 25, 2008, the Law of the Intern. Two of these directly and one indirectly, as shown below:

Report 1
"Internship is the supervised educational act, developed in the work environment, which aims to prepare students for productive work ..." (Law nº 11788, of September 25, 2008). (p. 8. Emphasis added)

Report 2
According to Law nº 11,788, OF SEPTEMBER 25, 2008, Art. 1st Internship is the supervised school educational act, developed in the work environment aimed at preparing students for the productive work that are attending regular education in higher education institutions, professional education, high school, special education in the final years of elementary school, in the professional modality of youth and adult education. (p. 10. Emphasis added)

Report 3
Activities began on July 1 with a 400-hour workload, in accordance with Law nº 11,788, which discusses student internship. (p. 3. Emphasis added)

It is noticed that the three examples differ in the way of making mention of the intern's law. There are two direct and one indirect quotes. All reports mention it in order to complement the objective of the internship activity, showing its legal recognition but they do it inappropriately compared to ABNT (2002) standards.

Source: authors' elaboration (our translation).

[32] Original: "*Três dos quatro relatórios fizeram menção à Lei Nº 11.788, de 25 de setembro de 2008, a lei do estagiário. Dois desses de forma direta e um de forma indireta, como vê-se a seguir:*

Relatório 1
'Estágio é o ato educativo supervisionado, desenvolvido no ambiente de trabalho, que visa a preparação para o trabalho produtivo de educandos...' (Lei Nº 11788, de 25 de setembro de 2008). (p. 8. Grifos nossos)

Relatório 2
Segundo a lei Nº 11.788, DE 25 DE SETEMBRO DE 2008, Art. 1º Estágio é o ato educativo escolar supervisionado, desenvolvido no ambiente de trabalho que visa à preparação para o trabalho produtivo de educandos que estejam frequentando o ensino regular de instituições de educação superior, de educação profissional, de ensino médio, da educação especial dos anos finais do ensino fundamental, na modalidade profissional da educação de jovens e adultos. (p. 10. Grifos nossos)

Relatório 3
As atividades tiveram início em 1º de julho com carga horária de 400 horas, de acordo com a Lei Nº 11.788, que discorre sobre o estágio de estudantes. (p. 3. Grifos nossos)

Percebe-se que os três exemplos diferem na maneira de fazer menção à lei do estagiário. Há duas citações diretas e uma indireta. Todos os relatórios a mencionam no intuito de complementar o objetivo da atividade de estágio, mostrando seu reconhecimento legal, mas o fazem de forma inadequada se comparados às normas da ABNT (2002)."

Example 6 – R4-ES[33]

Journal A
Section 2 – Article 06
The removal of President Dilma Rousseff is not an accomplished fact.

Section 2 of article 06 was taken from the newspaper *Folha de São Paulo*. The article was written by Raimundo Bonfim, lawyer and general coordinator of *Central de Movimentos Populares* and member of the national coordination of *Frente Brasil Popular* and defends the thesis that Dilma's impeachment is a blow to the result of the elections. It is noted, from the segment "The removal of President Dilma Rousseff", the modalization by the expression "not…an accomplished fact ". The speaker uses the assertive epistemic modalization, in the negative form, since it presents the denial of the truth of a statement segment: the removal of President Dilma. When stating that the removal is not an accomplished fact, specifically that it is not certain to occur, the speaker highlights his uncertainty regarding the removal of the president and endows the statement with a strong assertive character and, thus, commits himself to what was said. Thus, the highlighted expression can be classified as an assertive epistemic modalizer, in the negative form.

Source: authors' elaboration (our translation).

In R2-EM section, internship reports are analyzed as to enunciative aspects; in the case of R4-ES, although it appears in the report's methodology, opinion articles are analyzed according to modalizing elements. In both cases, the relationship that is established between the analysis materials (reports and opinion articles) and the theoretical categories is evident, thus linking the theory studied with practice. This procedure may be an indication of the appropriation of scientific concepts, making them operational in the interpretation of the data.

We also call attention to the linguistic-discursive construction of the excerpts. In R2-EM, the authors show the examples, discuss them and compare the results with ABNT norms, three "rhetorical movements" stipulated by Motta-Roth and Hendges (2010) for result sections and discussion of articles. R4-ES is structured in a similar way, with the display of examples and their interpretation.

In R3-ES, the analysis generically addresses the importance and validity of work with the genre meme in Portuguese language classes, with the presentation of a sample of the genre and a brief discussion about it, without addressing the categories predicted

[33] Original: "*Jornal A, Trecho 2 – Artigo 06*
O afastamento da presidenta Dilma Rousseff não é fato consumado.

O trecho 2, do artigo 06, foi retirado do jornal *Folha de São* Paulo. O artigo foi escrito por Raimundo Bonfim, advogado e coordenador geral da Central de Movimentos Populares e membro da coordenação nacional da *Frente Brasil Popular e defende a tese segundo a qual o impeachment de Dilma é um golpe contra o resultado das urnas. Nota-se, a partir do segmento 'O afastamento da presidenta Dilma Rousseff" a modalização pela expressão 'não... fato consumado'. O locutor utiliza-se da modalização epistêmica asseverativa, na forma negativa, uma vez que apresenta a negação da verdade de um segmento do enunciado: o afastamento da presidenta Dilma. Ao afirmar que o afastamento não é fato consumado, ou seja, que não é algo certo de ocorrer, o locutor evidencia sua incerteza perante o afastamento da presidenta e dota o enunciado de um forte caráter asseverativo e, assim compromete-se com o que foi dito. Dessa forma, a expressão em destaque pode ser classificada como um modalizador epistêmico asseverativo, na forma negativa*."

in the theoretical framework. It should be added that the subject addressed in the section is completely inconsistent with the research theme, since the meme does not belong to a textbook activity, whereas the objectives and the theoretical framework move towards the analysis of the Portuguese language textbook from a dialogical perspective.

Finally, we want to discuss the stage of publicizing research results, given that socializing knowledge is one of the main characteristics and purposes of science. Furthermore, engaging in these activities means, especially for students, to interact in the making of the scientific community beyond the institutional context, previously limited to the project team.

This phase is covered in all reports. Those related to undergraduate research program projects in high school point out: production and presentation of a complete paper (scientific article) at an international event (R1-EM); two presentations of work at local events and two at a national event (R2-EM). Those referring to projects in higher education mention: production and presentation of a complete work at a local event (R4-ES); preparation of articles and participation in regional, national and international events, without specifying any of them (R3-ES). These data suggest that students at both levels experience similar socialization practices, producing oral and written academic text genres such as scientific article, summary and oral presentation.

Conclusion

In this work, we proposed to analyze, comparatively, undergraduate research programs in high school and higher education, regarding the conceptions and guidelines recommended in official documents and the training aspects that are noticed in reports of projects developed at both levels. When studying undergraduate research program, as a science education action, in the light of Literacy Studies and the Academic Literacies approach, we start from the principle that this comparison must take into account not only the environment (school or university), but also, in an integrated way, the other elements of literacy events and practices that guide and constitute them: participants/groups, activities/routines and artifacts/resources.

The official documents of both levels share, in general, the concept of scientific education through research, as an educational (investigative attitude and formation of the critical sense to act in the world) and scientific (learning of the scientific practice and the formal stages of knowledge construction) principle. However, the analysis of the documents allows us to affirm that higher education appears as the privileged environment for undergraduate research programs, highlighting the diversity of programs and the financial resources made available, which can have implications on the scope (in terms of number of participants) and the results of research policy in educational institutions.

It is interesting to note that the documents at the national level aimed at all types of secondary education (LDB and BNCC) do not address undergraduate research programs

for this level of education. Only the National Curricular Guidelines for High School Technical Vocational Education and IFRN institutional documents do so, a sign that undergraduate research program, as an educational action through institutionalized research in high school, seems to constitute a more peculiar characteristic of this teaching modality or the federal network of professional and technological education.

In training terms, the analysis of the reports of projects in the area of Linguistics and Literature of the two levels of education allowed us to visualize some similarities, notably regarding the activities and routines of the knowledge construction and socialization process. These similarities, we believe, can be related, on the one hand, to the formal characteristics of scientific practice common to different areas, according to Demo (2012); on the other, to the situated character of the literacy practices of the same area of knowledge, which makes us expect that this process is, in fact, relatively similar, even if the environment is different.

The differences that we perceive between the reports - mainly in the configuration of some parts (sections) of the genre, in the greater or lesser understanding of the stages of project execution and in the products resulting from them - however, do not seem to be due to the level of education. R2-EM and R4-ES, for example, materialize more knowledge of academic literacy practices than R1-EM and R3-ES. Thus, we can assume that other elements would be more decisive than the environment (university or school) for the characterization of these literacy practices. We can conjecture, in this respect, the quality of the mediation process of the advisors, the effective participation of students in meetings and research groups during the execution of the project, the configuration of teaching and learning situations of scientific concepts and genres, determining aspects for the insertion of the student in the making of a discipline.

We conclude, then, that undergraduate research program at the basic and higher levels, from the two contexts investigated, has many similarities - general guidelines, conceptions, objectives and even the dynamics of construction of scientific knowledge - as well as differences, mainly of investments through the training policies and actions directed to each level of education. Other aspects, such as the training character of students who experience undergraduate research programs, seem to suffer more from other elements than of the environment (university or school) in which it occurs, in the context investigated by us.

LEITE, E.; PEREIRA, R; BARBOSA, M. A iniciação científica nos contextos da educação básica e superior: dos documentos oficiais aos aspectos formativos. **Alfa**, São Paulo, v.66, 2022.

- *RESUMO: A iniciação científica, tradicionalmente implementada no ensino superior, tem-se feito presente também no nível médio de ensino. Com base nessa realidade, objetivamos analisar, comparativamente, a iniciação científica nesses dois contextos, quanto a seus princípios e diretrizes, preconizados em documentos oficiais, e a aspectos formativos nas práticas educativas. Para isso, selecionamos, dos dois níveis de ensino, documentos oficiais*

que tratam dessa política de educação científica, assim como relatórios finais de projetos de iniciação científica da área de Linguística e Literatura. Tais dados são analisados a partir de reflexões sobre educação pela pesquisa e de estudos sobre letramento e letramento acadêmico, mediante abordagem qualitativo-interpretativista. As análises indicam que os documentos oficiais, em ambos os contextos, se fundamentam em concepções semelhantes, principalmente a pesquisa como princípio pedagógico, mas há diferenças de investimento, significativamente maior na educação superior. Os relatórios, por sua vez, sugerem a realização de atividades/rotinas parecidas no processo de construção e socialização do conhecimento científico, materializadas em textos que evidenciam conhecimentos e dificuldades que independem do nível de ensino. Na situação por nós investigada, portanto, há mais semelhanças do que diferenças entre a iniciação científica no ensino médio e superior, principalmente quanto aos aspectos formativos, apesar de desenvolver-se em ambientes diferentes.

- *PALAVRAS-CHAVE: letramento; letramento acadêmico; iniciação científica; ensino médio; ensino superior.*

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