

Initiation in the New High School: teaching practice at a public school in Salvador (2024)

Iniciação Científica no Novo Ensino Médio: a docência em uma escola pública de Salvador (2024)

Iniciación Científica en el Nuevo Bachillerato: la docencia en una escuela pública de salvador (2024)

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Abstract: This article aims to analyze the pedagogical experience developed in the Scientific Initiation course, a component of the formative itineraries of the New High School, at a public school in Salvador, Bahia, during the 2024 academic year. The course was designed to foster critical thinking, intellectual autonomy, and youth protagonism through the development of research projects. The study, conducted with two second-year classes, adopted a qualitative approach based on content analysis. The results indicate that Scientific Initiation can contribute to the development of investigative skills, the appreciation of academic writing, and the strengthening of student autonomy, while also revealing challenges related to curricular structure and teaching methodologies. It is concluded that the discipline constitutes a strategic space for critical education in High School, provided that adequate conditions for its implementation are ensured.

Keywords: Scientific Initiation. Research practice. New High School.

Resumo: Este artigo tem como objetivo analisar a experiência pedagógica desenvolvida na disciplina de Iniciação Científica, componente dos itinerários formativos do Novo Ensino Médio, em uma escola pública de Salvador, Bahia, no ano letivo de 2024. A proposta buscou estimular o pensamento crítico, a autonomia intelectual e o protagonismo estudantil por meio da realização de projetos de pesquisa. O estudo, de abordagem qualitativa e fundamentado na análise de conteúdo, acompanhou duas turmas da 2ª série do Ensino Médio. Os resultados indicam que a Iniciação Científica pode contribuir para o desenvolvimento de competências investigativas, para a valorização da produção escrita e para a construção da autonomia discente, ao mesmo tempo em que revelou desafios relacionados à estrutura curricular e às metodologias de ensino. Conclui-se que a disciplina pode constituir um espaço estratégico de formação crítica no Ensino Médio, desde que sejam asseguradas condições adequadas de implementação.

Palavras-chave: Iniciação Científica. Prática de pesquisa. Novo Ensino Médio.

Resumen: Este artículo tiene como objetivo analizar la experiencia pedagógica desarrollada en la asignatura de Iniciación Científica, componente de los itinerarios formativos del Nuevo Bachillerato, en una escuela pública de Salvador, Bahía, durante el año lectivo de 2024. La propuesta buscó estimular el pensamiento crítico, la autonomía

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intelectual y el protagonismo juvenil mediante la realización de proyectos de investigación. El estudio, de enfoque cualitativo y basado en el análisis de contenido, acompañó a dos clases del segundo año del Bachillerato. Los resultados señalan que la Iniciación Científica puede contribuir al desarrollo de competencias investigativas, a la valoración de la producción escrita y al fortalecimiento de la autonomía estudiantil, al tiempo que reveló desafíos vinculados a la estructura curricular y a las metodologías de enseñanza. Se concluye que la asignatura constituye un espacio estratégico para la formación crítica en el Bachillerato, siempre que se garanticen condiciones adecuadas para su implementación.

Palabras-clave: Iniciación Científica. Práctica de investigación. Nuevo Bachillerato.

Introduction

The present investigation has as its object of study an analysis of teaching practices in the discipline of Scientific Initiation within the scope of formative itineraries established by the New High School. The main objective of the study is to examine the contributions, opportunities and challenges associated with the implementation of this course in basic education, considering the pedagogical and structural requirements of the curriculum model. To this end, it is proposed to present the structuring and execution of a teaching plan developed throughout the 2024 academic year, with emphasis on the process of formulating research projects and the production of scientific articles by students. At the same time, we seek to discuss how Active Learning Methodologies can be incorporated into pedagogical practice, especially learning by investigation and problem solving (Bacich; Moran, 2018).

The development of this research, of a qualitative nature, was driven by concerns that arose throughout my teaching practice of Scientific Initiation in basic education in 2024, at the Luiz Tarquínio Military Police College (CPM), located in the Cidade Baixa region of Salvador (Bahia). We define the school not only as a professional setting, but also as a field of research on teaching and learning. The study was conducted using focus group techniques, with two second-year high school classes (2nd A and 2nd B), whose students actively participated throughout the three instructional units, distributed as follows: first unit (February to May), second unit (June to September), and third unit (September to December), complemented by documentary analyses, conducted and interpreted in light of the Content Analysis approach.

As highlighted by the research findings and the analyses of the curricular guidelines for High School, the pedagogical planning followed the National Common Curricular Base (Base Nacional Comum Curricular – BNCC, 2018), the Bahia Referential Curriculum Document (Documento Curricular Referencial da Bahia – DCRB, 2022), and the course syllabus. According to the listed documents, the practices consisted of didactic sequences, that prioritized the integration between research, investigation, problem-solving and the promotion of student protagonism. The development

of activities was centered on the adoption of Active Teaching Methodologies, with emphasis on the inquiry-based approach, in order to foster students' autonomy.

Throughout the process, students carried out research projects and produced scientific articles, culminating in the consolidation of an interdisciplinary formative experience aimed at the production of scientific knowledge. The subject was structured based on the development of an annual teaching plan (2024), whose design led to the construction of a didactic sequence articulated in three thematic units.

Thus, this article has the purpose of analyzing the teaching practice in Scientific Initiation in the New High School, discussing its potentialities and challenges. The text is organized into four sections: in the first, the theoretical framework that underpins the discussion is presented; next, the methodological procedures adopted are detailed; subsequently, the main results and analyses are discussed; finally, the concluding remarks are presented, highlighting the contributions of the reported experience.

Theoretical Framework

Considering the changes that have taken place in the New High School, the reform, approved by Law No. 13.415/2017, implemented a curricular restructuring at national-level. This reformulation increased the total workload of this teaching stage and distributed it between the National Common Curricular Base (Base Nacional Comum Curricular – BNCC) and the formative itineraries, which aimed at diversifying and flexibilizing students' educational pathways.

The proposal was based on the need to make High School more attractive and meaningful for current generations, fostering greater alignment between the students' interests and the demands of the labor market. Consequently, state education systems were required to revise and adapt their curriculum matrices in accordance with the new guidelines (Brasil, 2018a).

The main change was the creation of a curricular model composed of the National Common Curricular Base (Base Nacional Comum Curricular – BNCC) and formative itineraries, allowing students to choose areas of specialization according to their interests and aspirations. Therefore, the idea was to promote the gradual expansion of the minimum annual workload in High School. This reform generated intense debates among experts, educators, and society, especially regarding its implementation and its imposing and non-democratic nature, with impacts on the quality and equity of education.

Scientific Initiation in the school context seeks, according to the reform, to promote a dynamic articulation between theory, practice and problematization. In this process, students' autonomous

research would be stimulated, strengthening their critical capacity and their participation as active subjects in the construction of knowledge. This approach is in line with the principles established by the Law of Guidelines and Bases of National Education (Lei de Diretrizes e Bases da Educação Nacional – LDB, 1996), as it contributes to the integral formation of students through the mobilization of conceptual, attitudinal, and procedural knowledge. In addition, according to the BNCC (2018b), it seeks to foster the development of essential abilities and skills, such as argumentation, the ability to justify points of view, decision-making, the presentation of ideas and the application of knowledge in different contexts, both school and non-school.

In this sense, it becomes urgent to reflect, within the school environment, on the inclusion of research as a formative tool in High School. Therefore, questioning how the practice of Scientific Initiation can be conducted in a meaningful way to overcome a merely instrumental or technical approach. Thus, the research problem can be reformulated in the following terms: to what extent does the teaching of Scientific Initiation contribute to the development of students' critical thinking, intellectual autonomy and investigative capacity, preparing them for reading and conscious intervention in their reality?

In addition, this work presents the experiences of a pedagogical proposal centered on Scientific Initiation, which articulates investigative practice with the discussion of relevant contemporary topics, aiming to promote critical reflection on productivist rationality, while emphasizing the importance of scientific knowledge, popular knowledge, and scientific production in the school context.

Pedagogical work with High School classes, as established by the National Curricular Guidelines (Brasil, 2018a) and the National Common Curricular Base (Brasil, 2018b), must align with the issues and challenges reflecting national, regional, and local realities, as well as with the interests and needs of students, taking into account the formative itineraries. In this context, the teaching plan developed for the discipline of Scientific Initiation sought to consider a critical conception of the contents, methodologies, sources and educational objects, in order to improve the teaching of scientific research in basic education.

Specifically, in the Scientific Initiation formative itinerary of High School, the aim was to foster a more integrated and reflective approach to investigative practice, aligned with contemporary demands and the development of students' skills. The teacher, as the organizer of the teaching-learning process, plays a central role in the implementation of didactic mediation, assuming responsibility for the selection and contextualization of the knowledge to be addressed in the school setting.

In this sense, as Lopes (1999, p. 159) argues, didactic mediation constitutes a fundamental practice in adapting scientific knowledge into school knowledge, through its reconfiguration according to the particularities of the educational context. It is, therefore, a process that transcends the simple

transmission of content, since it requires a critical and intentional (re)elaboration of knowledge, with a view to adapting it to the concrete conditions of students' learning. Didactic mediation, in this sense, not only facilitates the teaching-learning process, but also promotes the constitution of school knowledge, whose purpose is to make knowledge more accessible, relevant, and pedagogically viable.

As stated in the BNCC document (2018b), the New High School, structured on the Basic General Education and the Formative Itineraries, implies considering the various dimensions of human experience as constitutive of the educational process. According to the LDB, teaching, therefore, must promote the articulation between science, technology, and culture, in order to ensure critical, civic, and ethical formation, as well as preparation for the world of work (Brasil, 1996).

The New High School proposal began to be implemented in 2022, with pilot schools initiating the application of the model. In Salvador, the Luiz Tarquínio Military Police College (CPM) was one of the institutions that served as a pioneer in the implementation of the reform. Of the 3,000 total hours of the New High School, 1,800 were allocated to Basic General Education, with compulsory subjects, and 1,200 hours reserved for the formative itineraries, in which students could choose areas according to their interests.

Law No. 13.415/2017 reformulated High School, making it, according to the text of the law, more "flexible and diversified," with a curriculum composed of the National Common Curricular Base and formative itineraries adapted to the local context and the capacities of the educational networks. In this context, formative itineraries were, in theory, created to ensure that students have the possibility of making choices in accordance with their interests and abilities. According to the BNCC, this proposal would aim to:

Ensuring the consolidation and advancement of the knowledge acquired in Elementary School is essential at this final stage of Basic Education. In addition to enabling the continuation of studies to all those who so wish, High School must meet the needs of general education indispensable to the exercise of citizenship and foster "learning attuned to the needs, possibilities and interests of students and also to the challenges of contemporary society (Brasil, 2018b, p. 464-465).

Therefore, the goal would be to offer pathways that connect with the demands of the labor market and the personal growth of students. These alternatives would, presumably, allow students to make choices among areas of interest to deepen their knowledge throughout their education. According to the structure and organization of the New High School, at the end of the first year, students select a formative itinerary according to the trajectory they wish to follow until its completion.

Although this proposal is presented as an advancement in the legal documents, its implementation has generated debates regarding the effectiveness of its flexibility, especially since it is a guideline established by legal mandate, which can limit students' real autonomy in their formative

trajectory. Thus, the proposal to reformulate High School sought to align the curriculum with the demands of the market and with the social and technological transformations of today. As Sousa and Alves observe:

The reformist discourse seeks to present the new curriculum as a necessary modernization and aligned with the learning of essential skills in order to make students flexible and able to deal with the most different realities in a dynamic and ever-changing environment (Sousa; Alves, 2024, p. 9).

The authors also suggest that this proposal was situated within context of the advancement of the neoliberal project, characterized by the compartmentalization of basic education and professional training aimed at the immediate demands of the labor market. In this sense, the practical implementation of this restructuring still faces significant challenges, especially in public school systems. Difficulties observed such as the reorganization of the workload of teachers', the expansion of assignments for teachers, who, for the most part, did not receive specific training to work on the itineraries and, finally, the scarcity of didactic materials for the components.

These issues, therefore, raise concerns about the consistency of the qualifications offered. The preliminary analysis presented here suggests that the reduction of the workload in general education components, to include topics considered more attractive, may not always contribute clearly to the strengthening of scientific and academic knowledge, in addition to being questioned by the students of the institution.

This discussion becomes even more relevant in the current context, marked by tensions around the recognition and value of scientific knowledge. Rabelo and Cavalari Jr. (2022, p. 23648) draw attention to the risk of replacing critical subjects with superficial content, given the growing tendency to prioritize immediate information over the solid construction of knowledge.

As shown in the following table, the proposal for Scientific Initiation in Salvador (Bahia) is based on a conception that presupposes the centrality of research as a pedagogical principle, intrinsically linked to an integrated education. Investigative practice, in this context, cannot be separated from the teaching dimension, as it results in the exercise of critical thinking and intellectual autonomy. Thus, High School assumes a formative role, potentially contributing, as long as it is integrated, to the development of cognitive, methodological and social competencies, in addition to encouraging autonomy, critical thinking, reasoned argumentation and the conscious use of technologies, in accordance with the general competencies provided in the BNCC for High School (Brasil, 2018b, p. 9-10).

TABLE 1 – Syllabus 2024: Curricular Components of the Scientific Initiation Itinerary of the 11th grade of High School (Workload: 3 hours per week / 120 hours per year)

| Syllabus (Scientific Initiation) | Objectives: |
|---|---|
| <p>Seeking understanding of what science is, the profile of the scientist, and who can do science. How science and scientific knowledge have been developed throughout history. Concepts of scientific methods, hypotheses, theories and laws, and the validity of scientific statements. Science, Technology, Society and Environment (STSE). Scientific matters. Popular education and science teaching. Comparison between common sense and scientific knowledge, and understanding the importance of dialogue between them. Importance of orality for the transmission of knowledge stored in human memory and writing for its production, as well as the transmission of human knowledge. Study on ethnoknowledge. Establishment of a relationship between scientific reasoning and the importance of curiosity, objectivity, rationality, systematicity, and scientific knowledge. Research on knowledge and its interfaces: popular, religious, philosophical and scientific. Seeking to understand scientific knowledge and the need for documentation, discussing the systematization of knowledge and the rigor of the applied methodology, as well as the importance of scientific knowledge for the individual and society. In-depth study of the history of science, in order to explore and reconstruct the scientific paths and biographies of major scientific figures, with the goal of humanizing scientists and challenging stereotypes. Recreation of scientific experiments. Promotion of activities involving the exploration of academic and scientific text genres. Organization and creation of exhibitions, clubs, fairs and academic olympics. Guidance on using the internet as a reliable research source. Promotion of activities involving the exploration of academic-scientific genres. Organization and creation of exhibitions, clubs, fairs, and academic olympics. Guidance on using the internet as a reliable research source.</p> | <ul style="list-style-type: none"> → Understanding what science is and the profile of a scientist: investigative, critical, curious, persistent and organized. Do you have to be a scientist to do science? How science and scientific knowledge have been developed throughout history. → Understand notions of scientific methods, hypotheses, theories, laws, and the validity of scientific statements. Science, Technology, Society and Environment (STSE). → Understanding science teaching: curiosity in the service of scientific research, contributions from the lay community, the movement to integrate society and scientists in support of research, platforms and projects. → Establish a dialogue between common sense and scientific knowledge. → Recognize the importance of orality for the transmission of knowledge stored in human memory. → Understand the Importance of writing for the production and transmission of human knowledge. → Understand the importance of community knowledge and practices; the interfaces between different knowledges (Indigenous, Quilombola, Romani). → Develop scientific reasoning and the importance of: curiosity, objectivity, rationality, and systematicity of scientific knowledge. → Understand the similarities and differences between popular, religious, philosophical, and scientific knowledge, and the need to record and systematize knowledge with rigor applied to the methodology. → Understand the importance of scientific knowledge for the individual and for society. → The history of science: exploring and recreating the scientific journeys and biographies of prominent figures in the world of science, and replicating scientific experiments. → Construct academic-scientific textual genres: abstract, critical review, academic poster, scientific report, exhibitions, clubs, fairs and academic olympics. → Understanding the Internet as a research source: recognize reliable information. |

Source: Prepared by the author based on the annual syllabus of the teaching pedagogical coordination of CPM Luiz Tarquínio, 2024, p. 5.

We consider that, although the school structure is organized around disciplinary compartmentalization, the reality experienced by students is complex and multifaceted, requiring the school to adopt an approach that goes beyond the mere transmission of content. It is necessary that the school be conceived as an environment for knowledge production, in which research functions as a daily and structuring practice of learning, guided by the development of values, skills, and competencies in real and meaningful contexts (Mendes, 2023, p. 39-42). This is one of the major challenges faced by Brazilian basic education, particularly in public schools.

Like the family and the community, the school plays a fundamental role in shaping students' identities in contemporary society. In this sense, it is understood that one of its main responsibilities is to provide a healthy educational environment capable of fostering youth agency. Thus, school culture must engage with the expectations of this generation, taking into account what students are expected to learn (Forquin, 1997, p. 9–26). In addition, according to Dermeval Saviani, “from all that has been said, it can be concluded that the political importance of education lies in its function of collaborative knowledge. It is by realizing itself within its own specific domain that education fulfills its political function” (Saviani, 2008, p. 70). Thus, the purpose of education is the development of the human being as a whole, through teaching aimed at social transformation, freedom, communication, and cooperation.

However, educational institutions frequently reflect the contradictions of capitalist society, functioning as mechanisms for reproducing social practices and power structures that can be exclusionary. To overcome this logic, it is essential to develop pedagogical practices that value student initiative, qualified teacher mediation, and the articulation between historically accumulated culture and the concrete interests of students. In this sense:

Educating through research requires an understanding of collaboration and partnership between teachers and pupils. It also requires reframing the teacher's role to act as a guide for students in the process of knowledge construction, indicating possibilities for verifying and problematizing the object of study. Thus, when considering student-centered learning, it is understood that the teacher's work is not limited to giving expository classes and using outdated resources. It is understood that the teacher must act as a mediator (Ferreira; Pereira; Ramos, 2024, p. 5).

In this understanding, formative itineraries, especially that of Scientific Initiation, can play a strategic role in promoting the development of investigative skills, articulating school, academic and popular knowledge, enabling students to construct knowledge through observation, inquiry, and intervention in real-world contexts.

Scientific learning in basic education, therefore, must start from real experiences, lived by students, involving their culture, identity, background, and social experience. In this sense, according to Bernard Charlot (2014):

Only those who engage in intellectual activity truly learn, but in order to have an intellectual activity, the learner must find meaning in it. A meaning related to learning itself, because if that meaning is completely unrelated to learning, nothing will happen. Once, a French adolescent told me: "At school, I like everything except the classes and the teachers." Of course, even in this case, school has meaning for the student, but that meaning is not connected to learning. There is no pleasure, and therefore, no meaning in learning. Only those who find some form of pleasure in the act of learning truly learn. When I say 'pleasure,' I am not opposing it to effort. One cannot educate a child without setting demands of them. There is no contradiction between pleasure and effort (p. 74).

Thus, the author argues that only those who attribute meaning to what they learn, and this meaning emerges from the relationship between knowledge and life experience. Hence, school-based research should be guided by questions relevant to the students' local context, allowing the development of investigative projects that address meaningful and socially relevant topics.

As such, the design and development of research projects—which involve selecting themes, defining spatial and temporal boundaries, formulating research questions, establishing objectives, choosing methods, applying data collection and analysis procedures, reviewing theoretical frameworks, and producing written work—become important tools for fostering intellectual autonomy and strengthening scientific culture in schools. By articulating theory and practice, academic and everyday knowledge, Scientific Initiation can help overcome the historical gap between basic education and scientific knowledge.

Methodology

This qualitative research analyses a pedagogical practice as a contemporary phenomenon situated within its social context. According to Alvarenga (2019, p. 17), this type of approach seeks to understand the causes and dynamics of phenomena through the interaction between collected data and amassed theoretical knowledge. Regarding its objectives, the study is classified as exploratory, as it aims to deepen the understanding of the topic and propose new ideas, with a flexible planning, as described by Gil (2002, p. 41). Regarding the procedures, bibliographic research is employed, based on books and scientific articles, and action research, since the professor, author of this study, was also directly involved in the researched environment, carrying out interventions throughout the process.

The pedagogical practice developed in this study was guided by a methodological approach that integrated school-based research and problem-solving methods, both grounded in the principles of

Active Methodologies. According to José Moran, "In active learning methodologies, learning takes place through real problems and situations; the same ones that students will encounter later in their professional lives, in advance, during the course" (Moran, 2015, p. 19). Therefore, the author points out that active methodologies can serve as an alternative to the traditional disciplinary model, particularly by promoting practices focused on active learning, based on problems, challenges, games, activities, and readings. This change involves balancing both individual and collective activities, as well as personal and group projects, which requires a reconfiguration of the curriculum, the teacher's role, the instructional organization, and the school's spaces and schedules. Thus, the adoption of active methodologies in the Scientific Initiation course at CPM Luiz Tarquínio aimed to promote student agency, intellectual autonomy, and the collective construction of knowledge through the investigation of situations meaningful to the students themselves.

The data for this study was collected through the systematic documentation of pedagogical practices carried out over the course of a school year within the curricular component linked to the formative itineraries, and involved continuous monitoring of the stages in the development of scientific articles by the students from the selection of topics and formulation of research questions, to the preparation of research plans and final submission of the papers. In all, 13 articles were analyzed, produced by two classes of the 11th grade of High School.

Documentary analysis was conducted on the articles produced, which served as the primary object of investigation, providing evidence on the application of investigative methodology in the school context, including written records, lesson plans, formative feedback, and field notes prepared by the class teacher, who also acted as a mediator of the pedagogical process.

For the analysis of the final papers, content analysis was applied (Bardin, 2016, pp. 49–51), allowing a systematic interpretation of the texts produced by the students. This method made it possible to categorize the data, such as the choice of themes, the application of methodologies, the use of sources and the level of scientific language. Content analysis was essential to identify patterns in the development of students' investigative skills and, therefore, took into account the historical, pedagogical, and social contexts in which the texts were produced, questioning the meanings attributed to thematic choices, the methods employed, and the forms of argumentation adopted by the students.

Not only were regularities in the use of scientific concepts observed, but also significant silences and absences, the "unsaid", which reveal limits to the research. Thus, the investigation was based on a corpus composed of the final articles, which were articulated with the records of the formative process carried out throughout the units. The analysis aimed to understand how scientific initiation, within the context of the New High School, contributed to the development of investigative skills and to the strengthening of students' autonomy and authorship in the learning process.

Results and Discussion

During the implementation of the proposal, problem-based learning constituted the central axis of the pedagogical activities. The students were organized into horizontally integrated groups and invited to identify, propose, and investigate problems related to their school, social, and cultural realities. This strategy enabled the mobilization of prior knowledge, the formulation of hypotheses, the conduction of research, and the development of possible solutions, connecting theory and practice in a contextualized and meaningful way.

At the same time, research was adopted as an educational principle understood not merely as a technique, but as an epistemological attitude that guided the entire teaching and learning process. In this context, as shown in the table below, the planning of the stages of scientific research was organized over the course of a school year, structured into three teaching units, which proved essential for the progressive development of the activities.

TABLE 2 – Integration between School Research Methodology and Problem-Based Learning

| Stages and objectives | Alignment with the Scientific Research Methodology in Schools |
|--|---|
| 1. Initial understanding of the problem in a real-world context. | Defining the topic and formulating the research question based on everyday school situations. |
| 2. Analysis of the variables involved and formulation of hypotheses. | Identification of causes and formulation of explanatory hypotheses, supported by students' prior knowledge. |
| 3. Organization and structuring of the research problem. | Definition of the research objectives, aligning the focus of the study with the group's goals. |
| 4. Collection and analysis of relevant information. | Literature review and consultation of various sources, with critical and contextual analysis. |
| 5. Planning of the research. | Selection of methodology and definition of data collection procedures, according to the research type. |
| 6. Collection, organization, and analysis of information. | Implementation of instruments, analysis of sources, and organization of empirical findings. |
| 7. Discussion of solutions and proposals based on the data. | Development of results and recommendations, connecting theory, practice, and observed reality. |
| 8. Dissemination of work results (other groups, school, community) and critical evaluation of the process. | Elaboration and submission of the final articles. |

Source: Table developed by the author, based on Barca (2004), Bordenave and Pereira (1982) and Zabala (1998).

Table 2 organizes the stages of research work and the resources employed, highlighting the development of competencies such as cooperation, source analysis, organization of ideas, argumentation, and the practice of conducting research using reliable sources. The structuring was based on the principles of scientific methodology applied to basic education and on the fundamentals

of problem-based learning, as discussed by the authors consulted in the development of the table. In addition, the proposal contributed to strengthening interpersonal bonds within the groups, requiring students to develop skills such as negotiation, tolerance, conflict resolution, and shared responsibility.

These aspects were analyzed in the evaluation process throughout the three teaching units, based on observations of students' individual and collective progress. In the proposal developed throughout the Scientific Initiation course, formative evaluation was adopted as the guiding principle of the evaluation process. This learning-centered approach emphasizes the continuous observation of students, fostering interaction and dialogue between teacher and student.

The focus was on the development of a final product to understand the cognitive and attitudinal processes engaged throughout the formative trajectory. From this perspective, students assume an active and shared responsibility for their learning trajectory. The first class aimed to present the course objectives, the evaluation criteria, and the parameters used for formative assessment, as well as the grading scheme for each activity. Among the central elements of formative assessment, the continuous monitoring process, the provision of qualitative feedback, the encouragement of self-assessment, and the flexibility required to adjust pedagogical practices (Caseiro & Gebran, 2008) stand out as key aspects to be considered when aligning with the investigative proposal of Scientific Initiation. Formative assessment enhances the development of autonomy, critical reflection, and student protagonism, essential aspects of the comprehensive education advocated by the New High School.

The teaching plan for the Scientific Initiation course, offered in person to 11th-grade classes A and B, included specific objectives, content, methodologies, and guiding questions that structured the students' learning trajectory. In this sense, Unit I (February to May) focused on understanding science as a historical, social, and human construction. Based on the guiding question "What is science and who can produce it?", students were led to understand the distinctions between scientific and popular knowledge, as well as to reflect on the methods and trajectory of scientific production. The activities focused on the reading and production of academic genres such as summaries, reviews, and reading notes, as well as the critical analysis of various sources, including the ethical and informed use of the internet as a research tool. The syllabus also included discussions on the relationship between science, technology, society, and the environment (STSE), popular education, and the dialogue among different forms of knowledge.

Unit II (June to September) aimed to strengthen the fundamentals of scientific methodology and to prepare students for the development of research projects. Guided by the question "How can a curiosity be transformed into a scientific project?", this stage promoted the identification and structuring of research elements such as theme, problem, hypothesis, methodology, and analysis. Different methodologies were explored, with an emphasis on discourse analysis and collaborative

work. In addition, students progressed in drafting the preliminary versions of their articles, based on source analysis and an understanding of the social role of scientific knowledge.

Finally, Unit III (September to December) focused on finalizing the projects and the dissemination of the research results. Guided by the question “How can a research project be transformed into a scientific article with impact?”, students conducted critical reviews of their texts, organized the final bibliography, and systematized the research data. The curricular organization allowed for monitoring students’ development throughout the year, fostering the building of investigative skills and the cultivation of a critical, ethical, and collaborative attitude toward the production of scientific knowledge.

As a guide for the analysis of the articles produced by the students, the following section presents a summary of the information extracted from the 2024 Scientific Initiation students’ articles, maintaining their identities anonymous. They are organized according to the approach to relevant themes, such as child trafficking, domestic violence against women, the use of artificial intelligence in education, and the inclusion of students with disabilities, topics interconnected with the social context.

Each stage of the process was carried out under the guidance of the teacher, allowing students to contribute their individual experiences, knowledge, and skills. This diversity of perspectives enriched the analysis of the data and offered a more comprehensive understanding of the topics explored by each team. The following presents detailed information on the themes and objectives of each investigation, the methodologies employed, and the conclusions reached, highlighting the main findings of each study.

Group I investigated the issue of racism in contemporary society, with research focused on how racism manifests in the school environment and its consequences for students' everyday lives. As a hypothesis, the group proposed that the presence of racism in the school environment negatively affects students’ academic performance, self-esteem, and social relationships. The group employed a qualitative research methodology, conducting interviews with students from different age groups and performing a literature review on school racism. The study’s findings indicated that racism in schools is a real and recurring problem, requiring targeted public interventions and policies, such as affirmative action, to foster inclusive and anti-racist education.

Furthermore, Group II focused on the mental health of young students, particularly those in high school, aiming to identify the factors that may affect their emotional well-being. Based on the hypothesis that school pressure, competitiveness, and the intense use of social media aggravate anxiety, stress, and depression, the research combined surveys administered to 11th-grade students in a qualitative and quantitative approach, followed by an analysis of the collected data. The findings revealed a high percentage of students who reported experiencing insomnia and anxiety. In addition, the

research also highlighted the need for greater attention to mental health in educational institutions, particularly through more welcoming environments and psychological support programs for the student body.

Additionally, Group III focused on the theme of religious intolerance in Brazilian schools, investigating how this phenomenon manifests itself and how it can be confronted within these institutions. The hypothesis proposed that religious intolerance in schools tends to perpetuate itself due to the limited initiatives to promote awareness of religious diversity and the low effectiveness of institutional policies aimed at confronting this issue. To investigate, cases of intolerance reported in newspapers were analyzed, along with interviews with teachers and students, supported by a review of the literature. The study concluded that religious intolerance remains a concerning reality in contemporary society, underscoring the need for education centered on diversity and inclusion, alongside the implementation of consistent policies for preventing and combating discrimination.

Meanwhile, Group IV examined the issue of teenage pregnancy, aiming to understand its impact on the educational and social lives of school-aged girls. The hypothesis proposed that early pregnancy can lead to school dropout, socioeconomic difficulties, and psychological impacts among young women. To investigate these issues, students analyzed public health data at the national and regional levels and examined support programs aimed at pregnant teenagers. The results indicated the need to expand preventive and guidance actions in schools, as well as to strengthen policies that ensure effective support for teenage mothers and the continuation of their studies.

Subsequently, Group V analyzed genetic syndromes and their impact on individuals' lives, examining how these conditions affect development and quality of life. It was theorized that these syndromes affect both physical health and psychological and social aspects, requiring specialized care. The research, based on a literature review and analysis of clinical cases, concluded that early diagnosis and integrated support are essential for improving the quality of life of affected individuals.

Subsequently, Group VI sought to understand the impacts of implementing the New High School on students' mental health in their school, examining the difficulties of adapting to the new curriculum, the relevance of elective course syllabi, the applicability of the knowledge gained to academic development, as well as the adaptation processes of students and teachers and the challenges posed by the limited instructional hours of the general education curricular components. The formulated hypothesis indicated that curricular changes, although promoting some flexibility, may contribute to increased anxiety and stress among young people, mainly due to the expansion of the number of subjects in the itineraries and the overload resulting from the curricular organization. To investigate this issue, interviews were conducted, institutional reports analyzed, and school practices observed. The results showed that, although the model represents advances in curricular

diversification, its implementation has revealed weaknesses, particularly due to limited psychosocial support in schools, compounded by structural problems in public schools, the small number of itineraries offered, and insufficient teacher training for working in new areas, reinforcing the need for a critical review of the New High School and the implementation of psychosocial support policies to help students adapt.

Group VII developed a study on child trafficking in Brazil, with an emphasis on the factors associated with its occurrence and the strategies outlined in public policies to address it. The investigation was based on the hypothesis that socioeconomic and educational aspects, failures in the social protection system, as well as the recurrent impunity related to this type of crime, contribute to its perpetuation. To this end, interviews with military police officers were conducted, a literature review was performed, and official data from the Brazilian Institute of Geography and Statistics (IBGE) were collected. The results indicated that child trafficking remains a persistent challenge, which requires coordinated actions between the State and civil society, as well as greater enforcement of criminal accountability for those involved.

Group VIII investigated domestic violence against women and femicide in Brazil, analyzing how violence affects the lives of these victims and the limitations of the enforcement of laws such as the Maria da Penha Law. The hypothesis identified factors such as economic dependence, normalization of violence, and lack of institutional resources to support victims. The methodology involved bibliographic research, analysis of statistics and interviews available online. The research showed that, despite legal advances, high rates of violence against women persist, along with a lack of more effective programs to combat gender-based violence and impose stricter penalties on perpetrators.

Thereafter, Group IX investigated the use of Artificial Intelligence by high school students at CPM, examining their access to new technologies and how they perceive and use these tools in the learning process. The hypothesis indicated that, although AI is positively received and supports personalized learning, its indiscriminate use can lead to dependence and compromise critical skills. Data were collected through questionnaires administered to 11th-grade students at the school, and subsequent analysis indicated the need for more conscious pedagogical use of these technologies and the implementation of training workshops.

Group X focused on the debate about the inclusion of students with disabilities in the CPM, investigating the possibilities and main challenges faced in this process. The students formulated the hypothesis that educational inclusion cannot be understood solely as access to education, but must be understood from a broader perspective. Such inclusion relies on consistent public policies, teacher training for inclusive practices, the supply of resources and assistive technologies, and the development of flexible pedagogical projects, in addition to promoting a school culture that combats prejudices and

values diversity, together with the support of multidisciplinary teams, as well as the elimination of physical barriers. Thus, the research consisted of interviews with students with disabilities and support staff at the school. The results showed that, although there is progress, structural and cultural barriers still persist that hinder full inclusion.

Group XI sought to investigate the family life of teenagers through the theme of sexuality, aiming to understand how sexual orientation can influence family relationships between young people and their guardians today. The hypotheses pointed to the lack of dialogue, the interference of moral and religious values, and the persistence of discrimination against LGBTQIAPN+ youth as factors of potential family conflict. Based on anonymous interviews with youths aged 15 to 18, it was found that, despite greater social acceptance regarding sexual diversity and more democratic debate in the classroom, prejudice and ignorance still negatively affect family life, exacerbating levels of anxiety and insecurity among youth.

Group XII investigated the influence of religiosity on Bahian gastronomy, examining how religion and culture shape cuisine, eating habits, and the transmission of knowledge across generations. The hypotheses suggested that religiosity influences ingredients and practices, while Bahian culture shapes food preferences and traditions. The research was conducted through interviews with the school's teachers and bibliographic analysis, concluding that Bahian cuisine is deeply connected to religiosity. However, it is at risk of being forgotten if not valued within educational spaces, while also serving as a powerful instrument for cultural preservation.

Finally, Group XIII investigated the pervasiveness of child labor in Brazil, with a particular focus on digital and television media. "The initial hypothesis posited that social inequality, family pressures, the exploitation of children's images, and lapses in oversight by competent authorities contribute to the persistence of the problem, despite the existence of protective legislation. The analysis, based on official data, media reports, and bibliographic research, showed that children and adolescents remain exposed to exploitation through digital content production, advertising campaigns, and early artistic careers. National and international examples, such as child YouTubers, exemplify the tensions between leisure, visibility, and economic exploitation. In addition to the legal and ethical impacts, emotional and social risks are notable, including anxiety, depression, and digital addiction. In conclusion, addressing media-related child labor requires increased supervision, strengthening of public policies, and the development of a culture that values childhood, with joint actions by the State, society, and families.

As observed, the systematization of the articles produced by the students allows us to observe not only the diversity and social relevance of the investigated topics but also the formative effects of the guided process of constructing scientific knowledge. Teacher mediation was fundamental in

promoting students' investigative autonomy, encouraging the formulation of research problems based on concrete concerns experienced in daily school and social life.

Throughout the process, students were challenged to connect theory and practice, applying appropriate concepts and methodologies to investigate topics such as racism, mental health, inclusion, religious intolerance, sexuality and gender, as well as the impact of the New High School. The pedagogical approach prioritized the development of critical reading skills, academic writing, and collaborative work, fostering an investigative mindset among youths. As a result, the articles presented in the previous abstract show significant advances in students' ability to understand and intervene in reality, reaffirming Scientific Initiation as a powerful strategy for critical, civic, and emancipatory education within the context of High School.

The experience developed over the course of the Scientific Initiation course, anchored in a transdisciplinary perspective, demonstrated the potential of school research as a pedagogical and formative pathway. The production of scientific articles by students in the 11th grade demonstrates how the school environment can serve as a space for generating meaningful knowledge, linked to the experiences, concerns, and realities of contemporary youth.

As the culmination of this formative process, the research projects produced were presented at regional scientific dissemination events, which went beyond the mere presentation of results, marking a milestone in the recognition of student research as a relevant and transformative practice within the context of Basic Education. The initiative is part of a broader institutional project, developed in partnership with the State University of Bahia (UNEB) through the Geotechnologies Education and Contemporaneity Group (Grupo de Geotecnologias Educação e Contemporaneidade – GEOTEC), affiliated with the Graduate Program in Education and Contemporaneity (Programa de Pós-Graduação em Educação e Contemporaneidade – PPGEduc).

Thus, the inclusion of students in diverse spaces for the production and socialization of knowledge reaffirms the importance of a public school committed to research, civic education, and the appreciation of science as an accessible and everyday practice. Rethinking the teaching–learning process, therefore, involves recognizing the school as a space for listening, meaning-making, and the articulation between academic knowledge and life experiences, reaffirming the role of scientific education in shaping possible futures.

Final Considerations

This study aimed to identify the possibilities and challenges of implementing the New High School, focusing on the pedagogical experience of the Scientific Initiation course in two 11th-grade

classes at a public school in Salvador, Bahia. The research combined theoretical reflection and teaching practice throughout 2024, highlighting the planning through thematic units and the development of research projects as teaching strategies.

It was ascertained that the work with Scientific Initiation fostered the adoption of inquiry-based and problem-solving teaching methodologies, strengthening student agency and broadening young people's understanding of how scientific knowledge is produced. At the same time, the results indicated that the dialogical approach adopted, with the teacher acting as a mediator, helped students perceive themselves as active agents in their own learning process.

On the other hand, some obstacles were highlighted, such as the lack of specific teaching materials, insufficient ongoing training focused on formative itineraries, and the initial resistance of some students regarding the relevance of the subject and its weekly workload. These factors revealed limitations that need to be critically addressed so that the proposal can achieve greater effectiveness in the future.

Hence, we argue that this report highlights urgent and indispensable issues that call for a rethinking of education in contemporary Brazil. This study, thus, concludes that the analyzed experience reaffirms the potential of Scientific Initiation as a space for critical and emancipatory learning in secondary education, as long as it is accompanied by public policies, proper institutional conditions, and sustained pedagogical support. By revisiting the main aspects discussed, this study reinforces the need to critically rethink the implementation of formative itineraries, ensuring the effectiveness of a comprehensive education for students.

References

ALVARENGA, E. **Pesquisa e prática em educação**. SESES: Rio de Janeiro, 2019.

BACICH, L.; MORAN, J. (org). **Metodologias ativas para uma educação inovadora**: uma abordagem teórico-prática. Porto Alegre: Penso, 2018.

BAHIA. Secretaria da Educação do Estado da Bahia. **Documento Curricular Referencial da Bahia – Etapa Ensino Médio: Volume II**. Salvador: Secretaria da Educação do Estado da Bahia, 2022. Disponível em: <<https://observatoriodeeducacao.institutounibanco.org.br/cedoc/detalhe/tf-documento-curricular-referencial-da-bahia-dcrb-volume-2-etapa-ensino-medio,80946d45-2c07-4d60-9262-ec91b2d97bac>>. Acesso em: 2 maio 2025.

BARCA, I. Aula Oficina: do Projeto à Avaliação. In. **Para uma educação de qualidade**: Atas da Quarta Jornada de Educação Histórica. Braga, Centro de Investigação em Educação (CIED), Instituto de Educação e Psicologia, Universidade do Minho, 2004, p. 131-144.

BARDIN, L. **Análise de conteúdo**. Tradução Luís Antero Reto; Augusto Pinheiro. 3. reimp. da 1. ed. São Paulo: Edições 70, 2016.

Olhar de professor, Ponta Grossa, v. 28, p. 1-20, e-25101.044, 2025. Disponível em <<https://revistas.uepg.br/index.php/olhardeprofessor>>

BORDENAVE, J. D.; PEREIRA, A. M. **Estrategias de enseñanza-aprendizaje**: orientaciones didácticas para la docencia universitaria. Instituto interamericano de cooperación para la agricultura, San José, Costa Rica, 1982.

BRASIL. Lei nº 9.394, de 20 de dezembro de 1996. Institui as Diretrizes e Bases da Educação Nacional. **Diário Oficial da União**, Brasília, DF, 23 dez. 1996. Disponível em: <http://www.planalto.gov.br/ccivil_03/leis/l9394.htm>. Acesso em: 25 set. 2025.

BRASIL. Lei nº 13.415, de 16 de fevereiro de 2017. Altera a Lei de Diretrizes e Bases da Educação Nacional e institui a Política de Fomento à Implementação de Escolas de Ensino Médio em Tempo Integral. **Diário Oficial da União**: Seção I, Brasília, DF, 17 fev. 2017. Disponível em: <<https://www2.camara.leg.br/legin/fed/lei/2017/lei-13415-16-fevereiro-2017-784336-norma-pl.html>>. Acesso em: 1 maio 2025.

BRASIL. Resolução CNE/CEB nº 3, de 21 de novembro de 2018. Diretrizes Curriculares Nacionais para o Ensino Médio. Atualiza as Diretrizes Curriculares Nacionais para o Ensino Médio. **Diário Oficial da União**, Brasília, DF, 21 nov. 2018. Disponível em: <https://www.mec.gov.br/rceb003_18>. Acesso em: 01 maio 2025.

BRASIL. Ministério da Educação. Conselho Nacional de Educação. **Base Nacional Comum Curricular** – BNCC. Homologada em 14 de dezembro de 2018. Brasília: MEC/CNE, 2018. Disponível em: <<https://basenacionalcomum.mec.gov.br/>>. Acesso em: 25 set. 2025.

CASEIRO, C. C. F.; GEBRAN, R. A. Avaliação formativa: concepção, práticas e dificuldades. **Nuances**: estudos sobre Educação, Presidente Prudente, SP, ano XIV, v. 15, n. 16, p. 141-161, jan./dez. 2008. Disponível em: <<https://revista.fct.unesp.br/index.php/Nuances/article/view/181>>. Acesso em: 26 set. 2025. DOI: <https://doi.org/10.14572/nuances.v15i16.181>.

CHARLOT, B. **Da relação com o saber às práticas educativas**. 1. ed., São Paulo: Cortez, 2014.

FERREIRA, G. R. A. M.; PEREIRA, S. L. P. de O.; RAMOS, K. S. de L. **Mostra científica por meio da intermediação tecnológica: narrativa de ação pedagógica no itinerário formativo de iniciação científica**. Anais do X Congresso Nacional de Educação. Campina Grande: Realize Editora, 2024. Disponível em: <<https://editorarealize.com.br/artigo/visualizar/111296>>. Acesso em: 02 maio 2025. ISSN 2358-8829.

FORQUIN, J. C. **Escola e Cultura**. Porto Alegre: Artes Médicas, 1997.

GIL, A. C. **Como elaborar projetos de pesquisa**. 4º ed., São Paulo: Atlas, 2002.

LOPES, A. R. C. **Conhecimento Escolar**: ciência e cotidiano. Rio de Janeiro: EDUERJ, 1999.

MENDES, C. da S. **Projeto de iniciação científica no curso técnico de informática de uma escola pública paraense**: práticas docentes que favorecem um estudo crítico e reflexivo. 2023. 111 f. Dissertação (Mestrado em Ensino) – Universidade do Vale do Taquari – UNIVATES, Lajeado, 2023. Disponível em: <<https://www.univates.br/bduserver/api/core/bitstreams/a8520dee-ec4a-43ef-af95-bdd49d85cb48/content>>. Acesso em: 2 maio 2025.

MORÁN, J. Mudando a educação com metodologias ativas. In: SOUZA, C. A. de; MORALES, O. E. T. (orgs.). **Coleção Mídias Contemporâneas**: convergências midiáticas, educação e cidadania: aproximações jovens. Ponta Grossa: Foca Foto; PROEX/UEPG, 2015. v. 2.

Olhar de professor, Ponta Grossa, v. 28, p. 1-20, e-25101.044, 2025. Disponível em <<https://revistas.uepg.br/index.php/olhardeprofessor>>

Rabelo, D. L.; Cavalari, O. J. Itinerário formativo como fragmentação do saber/ Educational itinerary as a fragmentation of knowledge. **Brazilian Journal of Development**, Curitiba, v. 8, n. 4, 2022, 23633–23652. DOI: <https://doi.org/10.34117/bjdv8n4-060>.

SAVIANI, D. **Escola e democracia**. Campinas, SP: Autores Associados, 2008.

SOUSA, J. P. de; ALVES, L. E. Emergência e circulação da fórmula discursiva “Itinerário formativo” e o projeto neoliberal na reforma do ensino médio. **Travessias**, Cascavel, v. 18, n. 2, p. 1-15, maio/ago. 2024. DOI: <https://doi.org/10.48075/rt.v18i2.33183>.

ZABALA, A. **A prática educativa: como ensinar**. Porto Alegre: Artmed, 1998.

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