



Historical perspectives on the establishment of the school subject Chemistry at CAP-UFRJ¹

Perspectivas históricas sobre a conformação da disciplina escolar Química no CAP-UFRJ

Perspectivas históricas sobre la conformación de la disciplina escolar de química en el CAP-UFRJ

Leonardo Dangelo

Universidade Federal do Rio de Janeiro (Brasil)

<https://orcid.org/0000-0001-7894-7120>

<http://lattes.cnpq.br/9494223094169530>

leonardodangelo@cap.ufrj.br

Abstract

This article investigates the genesis of the school subject Chemistry at CAp-UFRJ during its early years, examining its structure within the context of the school's creation and its implications for teacher training. It is based on documentary research and adopts the problem-history perspective as a methodological approach, seeking to understand the purposes and meanings attributed to the subject in that period. Drawing on the theoretical contributions of Chervel and Goodson, it characterizes the school subject as an autonomous cultural practice. It highlights aspects of curricular organization and pedagogical proposals that contributed to the development of a specific school culture.

Keywords: Education; History of Education; Chemistry teaching.

¹ English version by S.Iacovacci Translation Service. E-mail: siacovacci@gmail.com.

Resumo

Este artigo investiga a gênese da disciplina escolar de Química no CAP-UFRJ em seus primeiros anos, examinando sua estruturação no contexto da criação do colégio e suas implicações para a formação docente. Fundamenta-se em pesquisa documental e adota a perspectiva da história-problema como orientação metodológica, buscando compreender as finalidades e os sentidos atribuídos à disciplina no período. Com apoio teórico em Chervel e Goodson, caracteriza-se a disciplina escolar como uma prática cultural autônoma. Destacam-se aspectos da organização curricular e das propostas pedagógicas que contribuíram para a construção de uma cultura escolar específica.

Palavras-chave: Educação; História da Educação; Ensino de Química.

Resumen

Este artículo investiga la génesis de la asignatura escolar de Química en el CAP-UFRJ en sus primeros años, examinando su estructuración en el contexto de la creación del colegio y sus implicaciones para la formación docente. Se fundamenta en la investigación documental y adopta la perspectiva de la historia-problema como enfoque metodológico, con el fin de comprender los fines y los significados atribuidos a la asignatura en ese período. Con el apoyo teórico de Chervel y Goodson, caracteriza la asignatura escolar como una práctica cultural autónoma. Se destacan aspectos de la organización curricular y de las propuestas pedagógicas que contribuyeron a la construcción de una cultura escolar específica.

Palabras clave: Educación; Historia de la Educación; Enseñanza de Química.

Received: 2025/09/30

Approved: 2026/02/06

Introduction

In the study of school subjects, chemistry is often the subject of discussions regarding its importance, scope, and significance. Who is the target audience for the school-based study of this science? How do we define the boundaries of this knowledge? As Lopes (2005) points out, the school subject is a hybrid of curricular discourses rather than a singular path. In this sense, this article reveals the genesis of the school subject Chemistry at the Colégio de Aplicação of the (current) Universidade Federal do Rio de Janeiro (CAp-UFRJ), established in 1948.

This research is justified by its contribution to the study of Chemistry Education and the History of School Subjects in Brazil. It also helps address the lack of organized data and institutional memory regarding the Chemistry curriculum at CAp-UFRJ, as the institution lacks records of syllabi, textbooks used, and materials prepared by teachers during the time period covered by this study.

The objective of this study is to understand the development of the Chemistry discipline at CAp-UFRJ and the participation of some key actors in its early stages. To this end, documents were examined that shed light on the discipline's formation, including legislation, curriculum, course load, syllabi, and other activities related to the teaching of Chemistry at CAp. This analysis seeks to situate Chemistry within the school culture of the time, without disregarding the traditions that influenced its genesis.

The analysis of the documentation was conducted using Laurence Bardin's (2004) Content Analysis. This approach facilitated a dialogue between theoretical frameworks and primary sources, organized into three stages: pre-analysis, involving the reading and selection of the documentary scope; exploration of the material, involving the categorization of recurring themes; and the processing of results, where data interpretation was carried out in light of Chervel's concepts of school culture and autonomy.

In this study, the documentary corpus consists of primary sources, most of which are unpublished, located in the collection of the Education and Society Studies and Documentation Program (Programa de Estudos e Documentação Educação e Sociedade - PROEDES/UFRJ), which brings together documents from the former Faculdade Nacional de Filosofia (1939–1968). These sources were categorized into three groups: Institutional documents and reports (correspondence and internal memos); Administrative records (timetables and curricula); and Newspaper sources (newspapers from the National Library's Digital Newspaper Archive). This triangulation of sources guides the analysis developed throughout the article, allowing us to understand, based on the analyzed sources, that the Chemistry discipline at CAp was not a mere reflection of academic knowledge, but a construction forged in the difficulties of teaching practice faced by teacher-training students at the University of Brazil and in the pedagogical discussions circulating until 1948 (FRANGELLA, 2002).

I emphasize that these analyses consider their production context, marked by Getúlio Vargas's Estado Novo and the subsequent redemocratization of Brazil in the late 1940s. The Capanema Reform sought to modernize educational institutions, and understanding this context is fundamental for interpreting the discourses of pedagogical renewal advocated in the CAp.

Given the breadth of the documentary collection, we opted for a narrower scope of analysis that prioritized a greater potential to reveal tensions within school culture and the aims of the discipline. In light of this, the selected documents record daily activities and the school's public image—such as newspaper advertisements—rather than purely bureaucratic documents, allowing for a qualitative exploration of how chemistry education differed from established traditional teaching methods.

The concept of “problem-history” served as a perspective within the analytical methodology of this study, namely, documentary research. The documents were not viewed as consensual or given, but were problematized within their contexts (LE GOFF, 2013). In this

sense, they were selected based on criteria that prioritized their direct relevance to understanding the Chemistry discipline at CAP-UFRJ, such as their explicit focus on teacher training, curriculum structure, and teaching practices from 1948 to 1955. Materials that merely mentioned Chemistry indirectly or without offering interpretive insights were excluded.

In an effort to understand the society that produced them, the official documents found were analyzed, just as newspapers have been critically examined (LUCA, 2005). The interpretation of a document's content is shaped by the power relations of a given period, which differs markedly from a contemporary analysis. Documents are products of human actions and must therefore be analyzed (Le Goff, 2013). To this end, the analysis was conducted in stages. First, an exploratory reading was done to identify themes and main axes. Then, a critical reading was done that integrated the ideas of Chervel (1990) and Goodson (1997). These ideas are fundamental to understanding the school subject as an autonomous cultural practice, rather than merely as a reflection of academic knowledge. Finally, the information was organized into thematic categories to interpret the pedagogical practices and school culture at CAP-UFRJ.

This approach provides a more comprehensive and nuanced view, highlighting human experiences in their multiple dimensions. Peter Burke (1997) notes that cultures are not homogeneous, and studying them reveals historical processes marked by popular participation. It is worth noting that this analysis has limitations, such as the scarcity of sources documenting teachers' and students' daily practices and other documentary gaps. These limitations reinforce the need for complementary research to broaden understanding of Chemistry as a school subject at CAP-UFRJ and historical subject memories.

In the context of CAP-UFRJ, this analysis argues that the establishment of chemistry education sought to reconfigure the already-consolidated pedagogical traditions of a disciplinary community in Brazil since the 19th century, as indicated by the consulted sources. The argument begins with a study of the school subject as a specific entity in accordance with the historical perspective on disciplines. Then, it examines the origins of the Colégio de Aplicação and situates the theoretical principles that guided the analysis, such as those of Ivor Goodson and André Chervel.

School discipline as a distinct entity

First, we must clarify our understanding of school subjects, a concept on which there is little consensus in the literature. The concept of a school subject belongs to the realm of culture since its definition and construction lie in our actions and decisions. The focus of this work is chemistry, which has historically faced pressure primarily from the productive sector. This sector expected chemistry to serve as a foundation for understanding itself rather than as part of a social education focused on the citizen.

What seems natural today—such as all disciplines and the structure of a public education system being part of our culture—is not natural; we constructed it as such. Obviously, there is nothing natural about it, and teachers of all disciplines should periodically reconstruct their understanding.

As Bittencourt (2018) observes, a school subject goes beyond didactic transposition. This is how we typically refer to the process of simplifying and making more accessible complex academic knowledge—in other words, adapting or popularizing academic scientific knowledge. Thus, a necessary relationship of dependence exists, creating a hierarchy of knowledge in which the school subject fulfills the passive role of reproducing academic knowledge.

Circe Bittencourt (2018) highlights the autonomy of the subject, which has no conceptual or practical links to transposition. Here, the autonomy of not only the school subject but also the school as a whole is presented, as there is no direct link between school and academic knowledge. Researchers such as Ivor Goodson (1997) and André Chervel (1990) view the school subject as a

distinct entity with relative autonomy within an institution that generates knowledge: the school. In stark contrast to the didactic transposition perspective, these researchers view the school as an active entity and a producer of knowledge. Within this framework, teachers base their actions on more than merely reproducing or disseminating content. They act as active agents who reconfigure the teaching-learning process. In agreement with Goodson (2007), it is emphasized that what is addressed in a school differs from what is compartmentalized at a university. The university influences the school, but several other segments and influences are present in this constitution.

In the sense of an autonomous discipline, hierarchy is not considered, given how knowledge is constructed within the school. Chervel (1990) argues for a school culture suited to this construction. He considers possibilities such as sex education and environmental awareness that belong to the school context of chemistry rather than the academic context. In other words, the ability to produce a culture specific to its sphere is inherent to the school. Analyses indicate that chemistry goes beyond the mere reproduction of academic knowledge, presenting it as a culturally and socially constructed practice within the school context.

Since didactic transposition does not imply a separation between school and academia, at least in terms of knowledge structuring, it is reasonable to assume that academic knowledge dominates the school context. However, the formation of such a hegemony would lead to exclusive dependence and prevent schools from developing their own disciplines with specific objectives. Schools cannot be viewed as mere mirrors of academia.

According to Bittencourt (2018), Goodson and Chervel point out that the hierarchy extends beyond teaching relationships and epistemological considerations to encompass broader social connotations. This highlights how a lack of autonomy and freedom can hinder teaching and student development in schools. Using Karl Marx's (1818–1883) concept of class division, Bittencourt emphasizes the importance of studying school subjects to understand this societal division and the maintenance of privileges for certain social strata. Criticisms of transposition are not only epistemological but also social.

For Chervel, power relations are fundamental. His organizations must be studied historically to reveal the school's function, purpose, and the connection among discourse, text, and practice. School knowledge is tied to the school itself. It is a product of the school's methods and rules, rather than an outside imposition. According to Chervel, the discipline evolved in content to meet cultural transformations and the public's demand for change. Chervel (1990) also asserts that studying school disciplines is the key to understanding school culture, or the unique culture produced by the school.

Unlike Chervel, who focuses on topics such as curricular changes and curriculum organization, Julia (2001) advocates a broader approach that encompasses all cultural aspects of the school. She defines school culture as the set of norms that govern the knowledge to be taught and the practices that facilitate the transmission and assimilation of such knowledge. Another author who contributes to the discussion of school culture is Viñao-Frago (2006). He identifies the following elements as the most visible in this culture: actors (teachers, parents, students, administrative staff, and support staff); discourses, languages, concepts, and modes of communication used in academic and school settings; organizational and institutional aspects; and material culture.

Thus, the entire culture is articulated through the construction of school disciplines, contributing to the formation of citizens in line with the social and political demands of the period. There are constant tensions and shared ideas and interests between the school and society. Chervel (1990) relies on the construction of disciplinary frameworks based on school cultures to understand history, while Julia (2001) focuses on conflictual relationships across historical periods that encompass educational practices and their symbolic representations, as well as both conflictual and conciliatory relationships.

Since the school subject is part of the curriculum, it is necessary to provide some notes, if not to define it, then at least to indicate the aspect conceived in this work. Like the school subject, the curriculum is part of human culture; that is, it is not neutral and encompasses the complexity of relationships in society, with all its contradictions and conflicts.

De Abreu (1992) clarifies that implementing curriculum policies involves complex negotiation processes due to the context and actors involved. These actors influence and are influenced by discourses that create interdependence. Thus, the curriculum and the school subject emerge from this confluence of interests, which legitimizes their construction during a specific period. In another period, preferences may reside in a very different field.

How are subjects understood, and how are their characteristics identified? First, it is important to note that disputes within subjects reflect what occurs in the school as a whole rather than being isolated phenomena. Chervel argues that research of this nature must begin by examining the subject's objectives. However, a subject cannot be understood solely through the discourse of the school community or solely through documents (laws, decrees, curricula, and study plans, for example) because a subject is a complex cultural product. What is put into practice often differs significantly from what is conceived and determined in a document. Chervel's historical analysis depends on questioning the intention behind the implementation or restructuring of the discipline, which he termed the *study of purposes*.

Historians respond to this question by developing a consistent methodological framework for analyzing documents and practices. This allows them to grasp the historicity of knowledge and demonstrate that the production of disciplines is not a natural process. To distinguish actual purposes from stated objectives in documents, Chervel notes:

For the historian of academic disciplines, distinguishing between actual purposes and stated objectives is an absolute necessity. They must learn to distinguish between the two, even though official texts tend to conflate them. Above all, historians must realize that an official stipulation in a decree or circular more often aims to correct a state of affairs or modify or abolish certain practices than to officially sanction a reality (Chervel, 1990, p. 190).

From another perspective, Goodson (1997) employs a research method that examines the objectified curriculum and its stages of development and implementation in his social construction of the curriculum. This method rules out the possibility that school knowledge is merely derived from that organized within universities. School subjects arise from clashes among the involved actors. These clashes were not absent from the genesis of the UFRJ Application School, nor from the development of its various school subjects, as might be expected.

The Application College

The emphasis on teacher training can be traced back to the establishment of the training college in the mid-1940s. Initially, the college was affiliated with the Faculty of Philosophy. Unlike the Normal School, this type of school focused on educational discussions and research rather than teacher training for elementary education. Specifically, the country's first demonstration school opened in 1934 at the University of São Paulo under state jurisdiction. Fourteen years later, in 1948, a federal initiative emerged. Although legislation had provided for it two years earlier², the

² Decree No. 9053 of March 12, 1946, mandated the establishment of training schools affiliated with the faculties of philosophy in Brazil.

Demonstration School³ was founded in Rio de Janeiro and affiliated with the National Faculty of Philosophy, Sciences, and Letters of the University of Brazil. These details help contextualize the environment in which the discipline of chemistry was structured.

Until the UB Demonstration School was founded, teaching practicums for teacher candidates at this university were carried out in private schools and at Colégio Pedro II. Founded in 1837, Colégio Pedro II is considered the official model of a secondary school in Brazil. Despite completing these internships, the available institutions were certainly not places for reflection or for developing teaching, as they were not structured exclusively for these purposes.

According to Frangella (2002), the Demonstration School was established to improve teacher training in conjunction with the discipline of Didactics. The relationship between the two was intended to assist in developing techniques and ensuring the feasibility of the activities. Thus, at the CAP, supervised internship activities in various fields of knowledge (e.g., Chemistry, Biology, Portuguese Language, and Mathematics) and teaching experiments would be conducted with the active participation of teacher candidates.

The Beginnings of Chemistry at CAP

Until Chemistry was established as a distinct discipline within Basic Education at CAP-UFRJ, the prevailing view was that it should serve as a foundation for higher education and technical training.

One of the key moments leading to the establishment of the chemistry discipline at CAP-UFRJ was the training of teachers at the National School of Philosophy (Faculdade Nacional de Filosofia - FNFi). In other words, understanding the history of the discipline of chemistry requires understanding this training. Furthermore, the academic discipline "General and Special Didactics" existed within the same faculty from its founding. Its professors played a key role in designing the curriculum for the Application School. In short, there is insufficient evidence to suggest a significant shift in school culture at that time. Therefore, the history of teacher training at the former FNFi, specifically its General Didactics course, is directly part of the history of academic disciplines at CAP-UFRJ. *The 1942 Special Didactics of Chemistry Program*⁴—the course in which FNFi students were exposed to the methodology and teaching of chemistry—stated the following:

- 1) Development of science education in secondary school.
- 2) Chemistry education in Brazil and its role in various educational reforms.
- 3) General objectives of science education in secondary school.
- 4) Specific objectives of chemistry education in secondary school.
- 5) The value of chemistry education in secondary school and its contribution to achieving general educational objectives.
- 6) The relationships between science education in elementary school, lower secondary school, and upper secondary school, and the correlation between chemistry education and other subjects in secondary school.
- 7) General principles guiding the selection, organization, and presentation of subject matter.

³ Originally established under the name "Demonstration School," but later renamed "Application School," or by its abbreviation—Colégio de Aplicação - CAP.

⁴ Document bearing the name of the then-student Benedito Carlos Gouveia, dated March 14, 1942 (FEDERAL UNIVERSITY OF RIO DE JANEIRO, 1942).

- 8) The fundamental principles of chemistry and their objective definition, as well as the selection and presentation of technical vocabulary.
- 9) Critical analysis of the official curriculum for teaching physical and natural sciences in the first two grades of lower secondary school.
- 10) Critical analysis of the official curriculum for teaching chemistry in the last three grades of elementary school.
- 11) Critical analysis of the official curriculum for teaching chemistry in middle school.
- 12) Teaching materials. Selection and usage criteria. The classroom and laboratory, as well as their equipment and operation.
- 13) The Role of the Compendium in Chemistry Education: Selection Criteria and Critical Analysis of National Compendiums.
- 14) Planning techniques: course plan and lesson plan. Planning practice for all secondary school grades.
- 15) Motivation in Chemistry Education: Specific Motivation Techniques
- 16) Methods and techniques used in teaching chemistry in secondary school.
- 17) Individual Differences and the Teaching of Chemistry: Techniques and Methods Best Suited to the Problem
- 18) Exercises, Assignments, and Reviews in Chemistry Education. Practice formulating exercises and assignments.
- 19) Study methods for assessing learning in chemistry education, including criteria and practical guidelines. Practice designing tests and exams.
- 20) Observation and practice of chemistry education in secondary schools (Federal University of Rio de Janeiro, 1942).

An analysis of this document reveals evidence of the instrumentalization of chemistry education. This is evident in sections 14 through 18, which repeatedly use the words "technical" and "practical." The document places great emphasis on technique, indicating the cultivation of a culture that prioritizes technical knowledge. This suggests a movement toward affirming chemistry as an autonomous academic discipline. In other words, its educational purpose can be interpreted as aligning with the demands of industrialization at the time.

FNF's chemist training followed the well-known 3+1 scheme. After the first three years, students could take the courses in the *Didactics Program* and obtain a teaching degree, as shown in Table 1. According to Decree-Law 1190/1939, this course consisted of General Didactics, Special Didactics, Educational Psychology, School Administration, Biological Foundations of Education, and Sociological Foundations of Education.

According to Coutinho (2010), the chemistry program at the FNF had small classes of twelve students, allowing ample time for experimentation in various laboratories. Unlike programs in the humanities, the faculty included few foreign members. They encouraged research at the institution while also seeking to meet the industry's demands amid the modernization of Brazilian society.

Table 1 - Curriculum for the Chemistry program at FNFi, 1939–55

1939-1946	1947-1955
1st grade Supplementary Mathematics General and Experimental Physics General and Inorganic Chemistry Analytical/Qualitative Chemistry	1st Grade Supplementary Mathematics General and Experimental Physics Inorganic Chemistry Analytical Chemistry
2nd grade Physical Chemistry Organic Chemistry Analytical/Quantitative Chemistry	2nd grade Physical Chemistry Organic Chemistry Analytical Chemistry General and Experimental Physics
3rd grade Advanced Chemistry Biological Chemistry Mineralogy	3rd grade Biological Chemistry Mineralogy Physical Chemistry Organic Analysis
	4th Grade Advanced Chemistry Elective Courses: Preparative Inorganic Chemistry Organic Synthesis History of Chemistry Demonstration Chemistry Supplementary Courses in Analytical Chemistry

Source: Coutinho (2010, p. 112).

An important point raised by Coutinho, following an analysis of the curriculum, was the absence of interdisciplinarity, particularly between physics and chemistry. This was a notable omission from chemistry programs, which had previously been geared toward industry and offered as stand-alone courses.

What about those involved in teacher training at FNFi? It is noted that there was no competitive examination for FNFi faculty; instead, professors were selected based on political and ideological interests (Afonso & dos Santos, 2009).

This began with the professor of General and Special Didactics and the school's first director, Luiz Narciso Alves de Mattos. His guidance and influence set the tone for the CAP-UFRJ curriculum and the early years. Given the circumstances of the time, envisioning a school that "did not exist" until then seemed challenging, due to the difficulty of establishing venues for teaching practice for teachers across disciplines. Addressing these issues is essential to writing the history of a school discipline, as Chervel (1990) noted, because it clarifies the discipline's objectives.

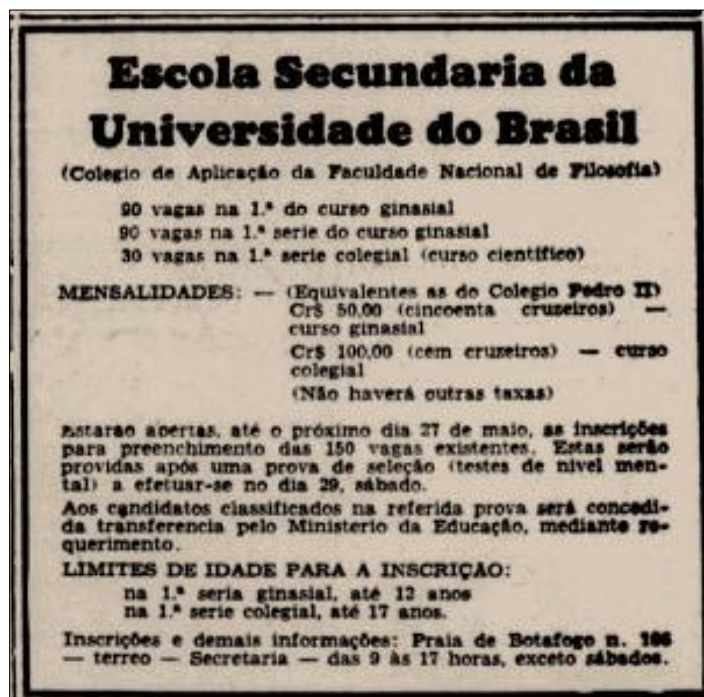
Mattos taught at FNFi, the National Institute of Educational Studies and Research (INEP) (1947–1963), the War College (ESG) (1949–1963), and the DASP School of Public Service (1960–1963) (FÁVERO & BRITTO, 2002; PIETROLUONGO et al., 2022). De Abreu (1992) highlights the high regard in which Mattos was held by the CAP-UFRJ faculty as a leader, granting teachers significant autonomy while retaining the final say in decisions.

Like other public high schools, CAP established a transfer selection process when it began operations midyear. This is a feature that distinguishes its students, as stated in the announcement opening the selection process for the "Escola Secundaria da Universidade do Brasil⁵" (Figure 1).

⁵ This was the name given to the Colégio de Aplicação in Rio de Janeiro newspapers such as *Jornal dos Sports*, *Diário de Notícias*, and *Jornal do Commercio* in May 1948.

The announcement highlights other features of the selection process, such as tuition fees equivalent to those of the Pedro II College and age limits for enrollment: 12 years old for middle school and 17 years old for high school. This means there was no minimum age requirement for admission. Another notable feature of the document is that the school's name appears in a subtitle, as if its official name were "University of Brazil Secondary School." This strategy was likely adopted due to the novel nature of Colégio de Aplicação.

Figure 1 - Announcement of the application process for the Application College – UFRJ



Source: Jornal dos Sports (1948).

Jornal dos Sports was a daily newspaper that covered not only sports, but also health and education, devoting several pages to these topics. Given the growing interest in soccer in the 1940s, the publication of the advertisement in Jornal dos Sports is highly significant; in other words, the newspaper had a large readership (COUTO, 2010).

Selectivity permeates the school's admission advertisement. The tuition fee requirement ultimately selects students from the economic elite. Another factor contributing to the formation of a small, selective group is the limited number of openings. The CAP, and consequently the chemistry curriculum developed there, was not intended for everyone, but rather an "elite cadre."

Another advertisement in Diário de Notícias (1948) provides instructions for the same selection process and adds relevant information, such as administering *mental tests*⁶ to classify students and form homogeneous classes. This was not unusual at a time when leading public schools, such as the Military School of Rio de Janeiro and Colégio Pedro II, relied on selection processes and when discussions about democratic access had not yet begun.

On June 29, 1948, the Rio de Janeiro newspaper O Jornal published a statement by Professor Luiz Narciso Alves de Mattos. In it, he explained some of the intentions behind the CAP's pedagogical organization.

⁶ Since classes at the school did not begin until the second semester, in August, there was no formal student selection process, but rather what came to be known as *mental tests*. Only three first-year middle school classes and two first-year high school classes (one for the humanities track and one for the sciences track) were admitted.

Though the idea of a training school affiliated with a university is new to us, it has long existed in other countries. In the U.S., there are more than three hundred such institutions designed to provide prospective secondary school teachers with practical training and allow university professors to test new teaching methods. These training schools have greatly advanced American secondary education, making it renowned worldwide for its highly competent teachers and efficient standards. Decree-Law No. 9,053, issued on March 12, 1946, mandated the establishment of such institutions in all philosophy departments nationwide. Since then, under the leadership of Rector Prof. Azevedo Amaral, director of the National Faculty of Philosophy, and myself, director of the Application School, the university has consistently worked to achieve this objective in the capital of the Republic.

The Application College is organized like other high schools and colleges in Brazil. This college is governed by the 1942 Organic Law on Secondary Education, like any other similar institution in the country, in all aspects of organization, grading, class numbers, and curricula. The only differences are: First, the school is under the technical and administrative direction of the Department of Didactics at the National Faculty of Philosophy. In collaboration with the other pedagogical departments of this institution of higher learning, the department will guide the school toward the most progressive trends in modern education. Second, the school's faculty consists of the best teachers licensed by the National Faculty of Philosophy. This elite staff is dedicated to applying modern teaching methods. Third, for four months each year, students pursuing teaching degrees at the same faculty conduct their teaching observations and practicums at the aforementioned school. This does not disrupt the normal rhythm of schoolwork, and the students always adhere to the established methodological guidelines. This initiative by the University of Brazil has generated great interest in our community. We have well-founded hopes that, over the years, this institution will contribute positively and substantially to the educational progress of our country and the renewal of teaching methods in our secondary schools. (O JORNAL, 1948, p.1).

The first thing to note about this statement is that the school's organization did not differ from others in terms of its curriculum. This was not due to a lack of proposals or initiatives, but rather because a 1942 law, the Capanema Reform, had established the framework for secondary education in Brazil and imposed a rigid curriculum. One of the Reform's objectives was to centralize and unify education throughout Brazil within an authoritarian context, with virtually no participation from civil society. Due to compliance with the 1942 law, the vision of a school serving as an experimental base for education was still a long time coming.

Regarding the differences listed by Professor Mattos, the first affirms the relevance of the technical and administrative leadership of his FNFi department, whose educational trends were said to align with modern approaches, though these were not specified. Each curricular sector of the school was headed by a professor of special didactics from FNFi, who selected CAP-UFRJ teachers from students excelling in their discipline.

According to De Abreu (1992), Professor Mattos's alleged didactic-pedagogical innovations were in contrast to an education that imposed discipline. He believed that the school should provide students with extracurricular activities, such as athletics, recreation, social activities, drama, conferences, debates, and scientific clubs. According to Mattos, these activities would provide students with a safe space for experimentation.

Professor Albert Ebert⁷, the first assistant in Special Didactics working directly under Director Luiz de Mattos, was committed to improving the institution. This commitment is evident in a letter from April 1948 in which Director Mattos requests that Ebert assess the chemistry laboratory's needs. The list contains approximately three hundred items, ranging from reagents and solvents to equipment such as a heating oven. Notably, Professor Ebert served as director of the Colégio de Aplicação from 1974 to 1976, underscoring his importance and prominence.

Ebert studied medicine to obtain a secondary school teaching license, not to practice as a doctor, as he recounts in an interview (Lutfi, 2012). Beginning in the 1950s, Ebert authored several chemistry textbooks for secondary education in accordance with the Ministry of Education's curriculum.

As previously mentioned, the secondary school chemistry curriculum at the Colégio de Aplicação was no different from that of other Brazilian educational institutions, legally speaking, just as was the case with the school's organization. A 1943 Ministerial Ordinance established the chemistry curriculum for the classical and scientific tracks for all of Brazil. It outlines a systematic and detailed curriculum for the scientific track, divided into: First Year: General Chemistry; Second Year: Organic Chemistry, and Third Year: General Study of Metals.

The Classical track's curriculum was essentially the same but more concise and less in-depth, according to a 1953 analysis by Werner Gustav Krauledat, a chemistry professor at FNF, during a meeting to develop chemistry textbooks. The second year covered topics in general chemistry, while the third year squeezed in organic chemistry and the general study of metals (BRASIL, 1943).

For this study, I note that following the Capanema Reform, the second cycle of secondary education (the last three grades) offered two tracks: classical and scientific (Brazil, 1942). According to Decree-Law 4244/1942, these tracks "shall aim to consolidate and develop the education provided in lower secondary school." Therefore, both were structured for continued studies, i.e., higher education. The classical track was intended for students interested in pursuing a course of study in the humanities, such as law. The scientific track, as the name implies, was intended for students interested in pursuing a course of study in the exact sciences or "a more in-depth study of the sciences," as stated in the decree-law.

According to the provisions of the 1942 law, chemistry was to be included only in the classical track in the second and third grades. However, in the scientific track, it was to be included among the final three high school grades. The educational purpose of each track was defined in Decree-Law 4244/1942. Chemistry was considered essential for students intending to pursue studies in the exact sciences. This difference highlights what Goodson (1997) refers to as the pursuit of status and curricular territory.

Timetables from the PROEDES archives for 1948, as well as tables from the initial course planning, are in accordance with applicable legislation (Figures 2 and 3). These documents reveal the function and organization of subjects within the curriculum, aligning with Chervel's (1990) perspective. These documents also show the distribution of class periods per week. The first and second grades of the Scientific Course had three periods, while the Classical Course had only two in the second grade. An evident hierarchy of knowledge exists within the curricula, with Chemistry representing an ancillary subject in the Classical Course.

⁷ He also served as coordinator of Natural Sciences, Natural History, and Chemistry at the FNF Model School.

Figure 2 - Class schedule for the first year of the Classical Program in 1948.

HORÁRIO						
CURSO CLÁSSICO						
HORAS	SEGUNDA-FEIRA	TERÇA-FEIRA	QUARTA-FEIRA	QUINTA-FEIRA	SEXTA-FEIRA	SÁBADO
7,30 às 8,20	Português Prof. Adolphina P. Bonapace	Grego Prof. Guida Ned-da Barata	Espanhol Prof. Hilda Reis	Grego Prof. Guida Ned-da Barata	Espanhol Prof. Hilda Reis	Francês Prof. Dulce Vas-concelos
8,25 às 9,15	Inglês Prof. Átila Gomes	Geografia Geral Prof. James Braga	Inglês Prof. Átila Gomes	Geografia Geral Prof. James Braga	Inglês Prof. Átila Gomes	Sociologia Prof. Irene Mal-la Carvalho
9,20 às 10,10	Educação Física	Francês Prof. Dulce Vas-concelos	Português Prof. Adolphina P. Bonapace	Francês Prof. Dulce Vas-concelos	Português Prof. Adolphina P. Bonapace	Grego Prof. Guida Ned-da Barata
10,10 às 10,30	Recreio	Recreio	Recreio	Recreio	Recreio	Recreio
10,30 às 11,20	História Geral Prof. Fábio Cris-tiano Figueiredo	Português Prof. Adolphina P. Bonapace	História Geral Prof. Fábio Cris-tiano Figueiredo	Educação Física	Grego (Líter*) Latim (Líter*)	Matemática Prof. Eleonora Lobo Ribeiro
11,25 às 12,15	Latim Prof. Maria Amélia P. Vieira	Matemática Prof. Eleonora Lobo Ribeiro	Latim Prof. Maria Amélia P. Vieira	Matemática Prof. Eleonora Lobo Ribeiro	Latim Prof. Maria Amélia P. Vieira	Latim Prof. Maria Amélia P. Vieira

Source: Universidade Federal do Rio de Janeiro (1948a).

Figure 3 - Class schedule for the first year of the Science Program in 1948.

HORÁRIO						
CURSO CIENTÍFICO						
HORAS	SEGUNDA-FEIRA	TERÇA-FEIRA	QUARTA	SEXTA - FEIRA	SEXTA-FEIRA	SÁBADO
7,30 às 8,20	Português Prof. Adolphina P. Bonapace	Matemática Prof. Marcos Pa-rante	Espanhol Prof. Hilda Reis	Matemática Prof. Marcos Pa-rante	Espanhol Prof. Hilda Reis	Matemática Prof. Marcos pa-rante
8,25 às 9,15	Inglês Prof. Hilda Maria N. de Silva Raddad	Geografia Geral Prof. James Braga	Inglês Prof. Hilda Maria de Silva Raddad	Geografia Geral Prof. James Braga	Inglês Prof. Hilda Maria de Silva Raddad	Sociologia Prof. Irene Mal-la Carvalho
9,20 às 10,10	Educação Física	Francês Prof. Dulce Vas-concelos	Português Prof. Adolphina P. Bonapace	Francês Prof. Dulce Vas-concelos	Português Prof. Adolphina P. Bonapace	Física Prof. Eleonora Lobo Ribeiro
10,10 às 10,30	Recreio	Recreio	Recreio	Recreio	Recreio	Recreio
10,30 às 11,20	História Geral Prof. Fábio C. Figueiredo	Física Prof. Eleonora Lobo Ribeiro	História Geral Prof. Fábio C. Figueiredo	Física Prof. Eleonora Lobo Ribeiro	Desenho Prof. Hilda Sofia de Nascimento	Sl. O. N.
11,25 às 12,15	Matemática Prof. Marcos Pa-rante	Química Prof. Benedito G. Medeiros	Desenho Prof. Hilda Sofia de Nascimento	Química Prof. Benedito G. Medeiros	Educação Física	Química Prof. Benedito G. Medeiros

Source: Universidade Federal do Rio de Janeiro (1948a).

Earlier timetables list Benedito Carlos Gouveia de Medeiros⁸ as the first head teacher of chemistry at CAP-UFRJ. He was hired in the same month that classes began. Like the rest of the Application School, the chemistry department had a special teaching assistant, Professor Albert Ebert, who mentored the head teacher. Class periods varied in length, ranging from 50 to 45 minutes, with the latter being the final period of the morning shift

⁸ Benedito was a student at the same National School of Philosophy, where he earned a bachelor's degree, as evidenced by documents listing his name among the students eligible to take midterm exams for the General and Special Didactics course. However, no document has been found to confirm that his degree was in chemistry (Diário de Notícias, 1941).

(Table 2). However, forty minutes were still allocated for *Guided Study*, which appears to have been a daily activity according to the initial course plan drawn up in mid-1948. This schedule conflicts with those in Figures 2 and 3 because it does not account for the exact duration of *guided study*, even though it was produced about a month later. Based on my analysis, I believe the schedules in Table 2 were designed to include *guided study* because the initial student admissions were by transfer rather than through a public selection process. Maintaining only four class periods would not allow for all the scheduled times to be allocated (five per school day, Monday through Saturday).

Table 2. CAP-UFRJ Course Schedule from 1948, created during the initial course planning phase.

Time	Duration	Event
7:30 – 8:20 a.m.	50 min	1st lesson
8:25 – 9:15 a.m.	50 min	2nd lesson
9:20 – 10:00 a.m.	40 min	Guided Study
10:00 – 10:30 a.m.	30 min	Recess
10:30– 11:20 a.m.	50 min	3rd lesson
11:25 – 12:10 p.m.	45 min	4th lesson

Source: Universidade Federal do Rio de Janeiro (1948b).

The subjects listed for the classical and scientific tracks in secondary school reveal certain societal values, such as the inclusion of humanities-related subjects like language instruction in English, French, Spanish, Latin, and Greek. This points toward the formation of an elite that prides itself on its supposed erudition. Despite the variety of subjects, the secondary education curriculum indicated that chemistry instruction was relevant only to students pursuing an academic career in the exact sciences. Therefore, the curriculum did not provide a broad education for all students. Licensure exams⁹, established by the 1942 law, reinforce this notion by distinguishing between the classical and scientific tracks in terms of the discipline within the field of exact sciences.

Art. 59. The Minister of Education shall issue the syllabi for the licensing examinations. § 1 The syllabi referred to in this article shall cover the essential content of each subject. § 2 The syllabi *for mathematics, physics, chemistry, and biology for the scientific license examinations shall be broader than those for the classical license examinations* (Brazil, 1942, emphasis added)

The CAP's faculty, which Mattos described as distinctive and remarkable, was composed of graduates of the FNFi, as evidenced by Professor Benedito Medeiros. Finally, regarding the purpose of the Colégio de Aplicação, he emphasized the participation of student teachers who would come there to learn about teaching practice. Throughout his presentation in June 1948, Mattos emphasized that CAP would be a school that followed the "modern" approach to education, without going into detail about what this proposal would entail. Since

⁹ The licensing exams were end-of-course assessments, divided into two categories: 1. Junior high school licensing exams, for completion of lower secondary education. 2. Classical and scientific licensing exams, for completion of the classical and scientific tracks, respectively (BRASIL, 1942).

no Chemistry syllabi from the early days of CAP's activities have been found, there is no way to analyze whether, institutionally, there were specific guidelines in this regard.

An evaluation of the final grades of students in the Science Course of 1948 (second semester) reveals that performance in Chemistry was the second highest, trailing only English (Table 3).

Table 3. Grades of students who passed the 1948 academic year in the Science Program.

Student	Portuguese	French	English	Spanish	Mathematics	Physics	Chemistry	History	Geography	Design
Moysés Lahtermaher	7,73	7,98	8,84	9,27	8,66	7,6	8,39	6,45	7,78	7,55
Alfredo Aref Anésio	7,31	9,15	8,6	8,01	8,68	7,82	9,01	6,26	5,91	8,1
Marcus Schorr	7,85	7,57	7,67	6,32	6,95	8,77	8,82	6,25	7,09	7,31
Milton Ferreira de Souza	8,39	6,7	7,5	8,31	7,6	6,9	8,3	5,77	6,84	7,59
Sérgio Augusto Ribeiro	6,68	7,04	8,64	6,53	8,27	6,42	6,85	5,66	5,49	7,43
Ayrton J. G. Gouget	7,01	6,05	6,15	7,63	5,77	6,86	6,91	5,64	6,46	6,4
Maria Anita Carvalho	6,75	6,28	6,19	5,51	5,21	4,46	6,21	5,77	5,32	5,43
Frank Willian Sá Rego	5,47	5,86	7,55	4,72	5,28	5,71	5,61	4,45	5,73	6,28
Torquato Saboia Pessoa	6,3	5,86	6,87	5,02	4,78	4,57	5,86	5,25	4,27	7,1
Sérgio Tepedino	5,93	5,42	6,31	4,35	4,23	5,31	7,26	5,55	5,58	5,36
Average	6,94	6,79	7,43	6,57	6,54	6,44	7,32	5,71	6,05	6,86

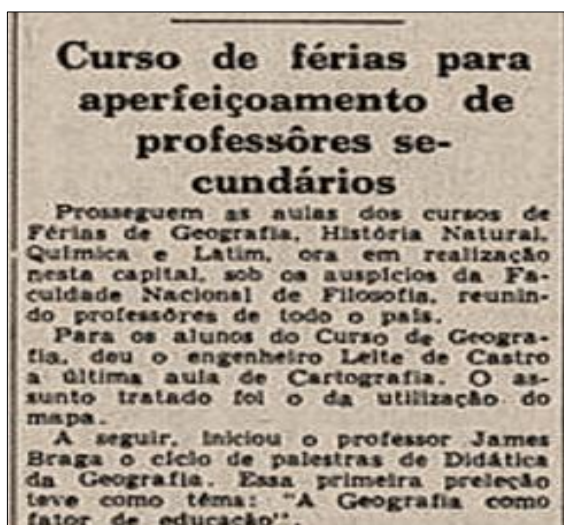
Source: Universidade Federal do Rio de Janeiro (1948c).

At the start of its second year of operation, the Colégio de Aplicação organized a summer course to train secondary school teachers. This initiative was part of the educational modernization project championed by Luiz Alves de Mattos. In December 1948, Mattos, who was then the director of CAP, requested recommendations for full or assistant professors committed to teaching in the course from the Department of Chemistry at FNF. The justification was based on the need to "recover the training of self-taught teachers through the review of specialized content" (Federal University of Rio de Janeiro, 1948d). In his request, Mattos linked teacher training to the importance of the specialized curriculum, which, according to Chervel (1990), can be understood as the definition of the objectives assigned to the discipline.

Among the planned courses, chemistry held a prominent place with a workload of fifty class hours, alongside natural history and classical literature. Publishing the initiative in the newspaper (Figure 4) reinforced its public and strategic nature and aligned with the discourse of the time. This allows us to analyze how the course was presented to the public. From an analytical standpoint, based on the course's curricular organization and on Goodson's (1997) perspective, the centrality of chemistry can be understood as part of a discursive and institutional movement to affirm the discipline's status and consolidate its place in the curriculum. This movement marks chemistry's prestige and relevance in education. At the same time, Chervel's (1990) work allows us to observe the construction of disciplinary school knowledge that goes beyond the mere transmission of academic content. This points toward the production of a distinct school culture in accordance with the CAP's educational objectives.

This action allows us to observe the institutional commitment to teacher education and the central role of the chemistry discipline in the CAP's educational proposals. It highlights critical and experimental pedagogical practices in the school.

Figura 1 - Anúncio de curso de férias.



Source: Diário de Notícias (1949).

In response to Mattos's request for collaboration, the acting head of the chemistry department agreed and recommended professors Werner Gustav Krauledat, José Walter de Faria, and João Christovão Cardoso for the program that took place from January 6 to February 11, 1949 (UNIVERSIDADE FEDERAL DO RIO DE JANEIRO, 1949a).

Concern for teacher training appears to be at the heart of the announced summer course initiative (Figure 4) given that teacher training was one of the Teacher Training College's objectives. According to Chervel (1997), this emphasis can be understood as the articulation of the purposes attributed to the school subject of chemistry in that context, linked to teacher training. The document notes the presence of "teachers from across the country," lending the event an air of relevance and grandeur.

The source is the newspaper Diário de Notícias, which was the morning paper with the highest circulation in the city of Rio de Janeiro. According to Carvalho Júnior (2005), it advocated economic nationalism in strategic matters. Contrary to the idea that technical education would be one of its main themes, however, there was a section titled "Diário Escolar — Education and Culture — Student Movement" featuring various publications from general education schools, such as Colégio Pedro II and Escola Sousa Aguiar, as well as the National Student Union. The presence of this advertisement reinforces the Colégio de Aplicação's role as a strategic educational institution in the development of specific educational concepts. This highlights the importance of understanding the history of school subjects to analyze educational practices.

The placement and size of the advertisements in the education section suggest that some, such as the one in Figure 4, were unpaid. Those that were paid for were given prominence in their layouts.

The vacation program divided the following topics among the three teachers, who will each lead one of the three blocks:

- 1) Atomic structure
- 2) Classification of elements
- 3) Atomic bonds
- 4) Acid-base theory
- 5) Nomenclature in inorganic chemistry

- 1) Nomenclature in organic chemistry
- 2) Isomerism in organic chemistry
- 3) General classification of organic reactions
- 4) The fundamental processes of organic chemistry: Nitration, halogenation, sulfonation, amination, oxidation, hydrogenation, esterification, and hydrolysis.

- 1) Chemical equilibrium
 - a. Homogeneous equilibrium: gas-phase equilibrium, solution equilibrium, and ionic equilibrium
 - b. Heterogeneous equilibrium: the phase rule
- 2) Chemical reaction kinetics
- 3) Fundamentals of photochemistry
- 4) Natural and artificial radioactivity, nuclear processes (UNIVERSIDADE FEDERAL DO RIO DE JANEIRO, 1949a).

For the 1949 academic year—its first full year of operation—a schedule of teaching practice sessions was drawn up for all courses. The chemistry department projected that ten teacher candidates would conduct teaching practice at CAp on Tuesdays, Thursdays, and Saturdays (chemistry class days), with 25% in the classical track and 75% in the scientific track¹⁰. The document also stipulated that chemistry student teachers were to teach ten classes at CAp and four at other high schools. Another provision for that year was that 50% of CAp classes should be reserved for teaching practice. Note the significant change in the internship designed for the Application School, which required conducting more than 70% of practical classes at this school.

In a report on the activities of the Department of General and Special Didactics of Chemistry and Natural History for 1949, Assistant Professor Dr. Albert Ebert recorded 106 classes taught by student teachers, divided between the CAp (95) and the Colégio Frederico Ribeiro¹¹ (11). Praising the distinctive teaching practice carried out at CAp, he wrote:

The teaching practice at C.Ap. was superior to the previous practice of conducting it at private schools because it allowed for more continuous and efficient interaction between the assistant professor and student teachers. This resulted in better guidance for the student teachers. Furthermore, feedback could be provided more calmly and immediately after the student teacher's lesson, making it more objective and constructive. However, the insufficient number of C.Ap. classes has hindered teaching practice and created genuine animosity between C.Ap. students and F.N.F. student teachers. Therefore, it is urgent to increase the number of C.Ap. classes as soon as possible to improve the efficiency of teaching practice for F.N.F. student teachers and reduce the burden on C.Ap. students (Federal University of Rio de Janeiro, 1949b).

¹⁰ The percentages were determined even though they do not correspond to whole numbers in this first group of graduates.

¹¹ Private school.

A conflict of purpose emerged, with the focus being on the instruction of high school students on one hand and the practical training of student teachers on the other. The subject was negotiated because it was both taught and studied, creating a unique school culture.

Having begun its first academic year in 1949, CAP-UFRJ held entrance exams for two first-year classes: one in the classical track and one in the scientific track. In addition to these, there were two other classes in their second year, one in each track, bringing the total to four classes. According to Professor Ebert, even though it was a specialized space for practice, there were still insufficient students to meet the needs of student teachers in Teaching Practice. Ebert's descriptions highlight a realistic approach to teaching practice where students conducted seminars on the curriculum, critiqued teaching materials, and observed classes. This approach aligns with the concept of school culture discussed by Chervel (1990) and the emphasis on humanistic education sought by the Capanema Reform.

Thus, a tradition in teacher training took shape. The history of the school subject of chemistry stemmed from the need for critical teaching practices and, consequently, an alternative to previous approaches in other schools. According to Professor Mattos, who holds a master's degree in education from a U.S. school of philosophy and brought with him the experience and significance of demonstration schools, these approaches were moving toward the most modern methods. Clearly, chemistry, like the other subjects, was organized and implemented within a framework of possibilities for student teachers, always taking into account critiques of teaching methods in elementary and secondary schools.

Final Consideration

By the end of this study, an overview could be outlined of the development and establishment of the academic discipline of chemistry at the Colégio de Aplicação of the University of Brazil, despite the documentary limitations encountered during the research.

The first regular, standalone chemistry courses in our country—excluding those in which it was a component of another program—were slow to be established, emerging more than two decades after the founding of the republic. Analyses of official curricula and reviewed literature revealed that the inception of these courses was primarily linked to an industrial focus. However, chemistry already had a disciplinary community in the country, which had been consolidating since the 19th century, as well as scientific and pedagogical practices in circulation before that period. This orientation is also reflected, to some extent, in the secondary education chemistry curricula of that period.

The organization of chemistry at the Colégio de Aplicação, as demonstrated by the curricula, teaching practice reports, and the summer course proposal, aimed to standardize trends toward renewing teaching methods in this subject area, both in terms of content and in the emphasis placed on teacher training and critical practices. In this context, initiatives associated with Luiz Narciso Alves de Mattos's work point to the emergence of a more autonomous conception of teacher training. This conception required a dedicated space for teaching practice beyond traditional private schools and Pedro II.

Improving this training was a central pillar of the CAP project. Analysis of the documents suggests that this space was conceived as a privileged location for testing and evaluating methodologies geared toward secondary education, as it was called at the time. These methodologies were embedded in a project that sought to relax rigid pedagogical practices and align teaching with emerging social demands. However, it is recognized that the analyzed sources have limitations in fully revealing daily school life and classroom dynamics. This points to the need for future research that explores the practices and memories of teachers and students.

The organization of the CAP reflects the period's pedagogical modernization aspirations. From a broader perspective of university education in Brazil, the genesis of the CAP-UFRJ influenced the development of the chemistry curriculum, with notable figures such as Albert Ebert and Luiz Narciso Alves de Mattos playing pivotal roles. According to Goodson (1990), these developments can be understood as part of the struggles for status and the consolidation of the discipline's curricular territories.

The research revealed that the chemistry discipline at CAP was embedded in a teacher education logic oriented toward more than mere didactic transposition. This was observed through analyses of the Special Didactics programs and Ebert's accounts. Thus, the articulation between school culture and pedagogical practices emerged as essential to understanding the significance of school discipline as a cultural and social practice.

Finally, the constitution of the school subject of chemistry at CAP-UFRJ suggests that it was not limited to reproducing academic knowledge. Rather, it pointed toward constructing a critical conception of school, marked by the tensions and negotiations characteristic of school spaces. This concept resonates with the idea of school disciplines as autonomous cultural practices (Chervel, 1990), developed within schools in response to their needs and values. This study aims to contribute to future research that delves deeper into the relationships among school culture, teaching practice, and school disciplines. This will broaden reflection on the role of disciplines in civic education and the history of education.

References

- AFONSO, Júlio C.; DOS SANTOS, Nádia P. *Instituto de Química da UFRJ - 50 Anos*. Rio de Janeiro: EdUFRJ, 2009.
- BITTENCOURT, Circe Maria F. *Ensino de História: fundamentos e métodos*. São Paulo: Cortez Editora, 2018.
- BLOCH, Marc. *Apologia da História*. Rio de Janeiro: Zahar, 2001.
- BRASIL. Decreto-lei nº 4.244, de 9 de abril de 1942. *Decreta a Lei Orgânica do Ensino Secundário*. Diário Oficial da União, Brasília, DF, 9 abr. 1942. Disponível em: <https://www2.camara.leg.br/legin/fed/declei/1940-1949/decreto-lei-4244-9-abril-1942-414155-publicacaooriginal-1-pe.html>. Acesso em: 18 abr. 2024.
- BURKE, Peter. *Escola dos Annales (1929-1989): a Revolução Francesa da historiografia*. São Paulo: FEU, 1997.
- CARVALHO JUNIOR, Celso. A criação da Petrobras nas páginas dos jornais O Estado de S. Paulo e Diário de notícias. In: ENCONTRO REGIONAL DE HISTÓRIA – O LUGAR DA HISTÓRIA, XVII, 2005, Campinas. *Anais...* Campinas: ANPUH, 2005. Disponível em: <http://legacy.anpuh.org/sp/downloads/CD%20XVII/ST%20V/Celso%20Carvalho%20Junior.pdf>. Acesso em: 8 set. 2024.
- CHERVEL, André. História das disciplinas escolares: reflexões sobre um campo de pesquisa. *Revista Teoria e Educação*, Porto Alegre, n. 2, p. 177-229, 1990.

COUTINHO, Danielle Souza. *Universidade, ciência, universitários: caracterização social e escolar dos estudantes de Química da Faculdade Nacional de Filosofia da Universidade do Brasil (1939-1968)*. 2010. 149 f. Dissertação (Mestrado) - Programa de Pós-Graduação em História das Ciências e da Saúde, Fiocruz, Rio de Janeiro, 2010.

COUTO, André Alexandre Guimarães. *Cronistas esportivos em campo: letras, imprensa e cultura no Jornal dos Sports*. 2016. 347 f. Tese (Doutorado) - Pós-Graduação em História, do Setor de Ciências Humanas, Letras e Artes, UFPR, Curitiba, 2016.

Curso de férias para aperfeiçoamento de professores secundários. Rio de Janeiro, ano 1949, 4 fev 1949, p. 2.

DE ABREU, Alzira A. *Intelectuais e guerreiros: o Colégio de Aplicação da UFRJ de 1948 a 1968*. Rio de Janeiro: Editora UFRJ, 1992.

Escola Secundaria da Universidade do Brasil. *Jornal dos Sports*, Rio de Janeiro, ano 1948, 16 mai 1948, p. 7.

FÁVERO, Maria de Lourdes A.; BRITTO Jader M. *Dicionário de Educadores do Brasil*. Rio de Janeiro: Editora UFRJ/MEC-Inep-Comped, 2002.

FRANGELLA, Rita de Cássia Prazeres. Colégio de Aplicação e a instituição de uma nova lógica de formação de professores: um estudo histórico no Colégio de Aplicação da Universidade do Brasil. In: CONGRESSO BRASILEIRO DE HISTÓRIA DA EDUCAÇÃO, I., 2002, Rio de Janeiro. *Anais...* Rio de Janeiro: SBHE, 2002. p. 375-376.

GOODSON, Ivor F. *A Construção Social do Currículo. Coletânea de textos*. Lisboa: Educa, 1997.

JULIA, Dominique. A cultura escolar como objeto histórico. *Editora da Unicamp*, Campinas, v. 1, p. 9-43, 2001.

LE GOFF, Jacques. *História e Memória*. Campinas: Editora da Unicamp, 2013.

LOPES, Alice Casimiro. Discursos curriculares na disciplina escolar química. *Ciência & Educação*, Bauru, v.11, p.263-278, 2005. DOI: <https://doi.org/10.1590/S1516-73132005000200009>.

LUCA, Tania Regina de. História dos, nos e por meio dos periódicos. In: PINSKY, Carla Bassanezy. (Org.). *Fontes Históricas*. São Paulo: Contexto, 2005. p. 111-153.

LUFTI, Mansur. Produção social de livros escolares de Química no Brasil, de 1810 a 1941. *Revista Virtual de Química*, v.4, n.6, p.703-718, 2012. DOI: <https://doi.org/10.5935/1984-6835.20120053>.

MATTOS, L. N. A. Renovar os métodos de ensino em nossas escolas secundárias [Entrevista concedida]. *O Jornal*, Rio de Janeiro, 29 jun. 1948, p. 1.

MINISTÉRIO DA EDUCAÇÃO DE SAÚDE. Portaria Ministerial nº 216, 18 de março de 1943. Expede os programas de Química do curso clássico e do científico do ensino secundário. *DOU*. Rio de Janeiro-DF, ano 1943, n. 216, 18 mar. 1943. Disponível em: <http://arquivohistorico.inep.gov.br/index.php/codi-uniper-m1072p01-programadequimicadocursoclassicoecientifico-1943-1>. Acesso em: 09 jun. 2024.

PIETROLUONGO, Monica et al. *MemoCap*: uma história social do Colégio de Aplicação da UFRJ (CAp-UFRJ). YouTube, 20 de junho de 2022. Disponível em <https://www.youtube.com/watch?v=bqPCsMJraFM>. Acesso em 02 de maio de 2024.

UNIVERSIDADE FEDERAL DO RIO DE JANEIRO. Arquivo PROEDES CAP 003ENS21. *Quadro de Horário do CAp-UFRJ de 1948*. Rio de Janeiro: Arquivo da Faculdade de Educação, Centro de Documentação PROEDES, 1948b.

UNIVERSIDADE FEDERAL DO RIO DE JANEIRO. Arquivo PROEDES CAP 029ENS 015. *Grade Curricular Cursos Clássico e Científico*. Rio de Janeiro: Arquivo da Faculdade de Educação, Centro de Documentação PROEDES, 1948a.

UNIVERSIDADE FEDERAL DO RIO DE JANEIRO. Arquivo PROEDES CAP 070LIC 178 *Carta Solicitando colaboração dos departamentos da FNFi para os Cursos de Férias para professores secundários*. Rio de Janeiro: Arquivo da Faculdade de Educação, Centro de Documentação PROEDES, 1948d.

UNIVERSIDADE FEDERAL DO RIO DE JANEIRO. Arquivo PROEDES P033/ENS044. *Relatório de atividade do CAp*. Rio de Janeiro: Arquivo da Faculdade de Educação, Centro de Documentação PROEDES, 1948c.

UNIVERSIDADE FEDERAL DO RIO DE JANEIRO. Arquivo PROEDES P065/LIC091 *Relatório sobre as atividades no curso de Didática especial de Química e História Natural*. Rio de Janeiro: Arquivo da Faculdade de Educação, Centro de Documentação PROEDES, 1949b.

UNIVERSIDADE FEDERAL DO RIO DE JANEIRO. Arquivo PROEDES P070/LIC185 *Colaboração do Departamento de Química da FNFi para o curso de férias para professores secundários*. Rio de Janeiro: Arquivo da Faculdade de Educação, Centro de Documentação PROEDES, 1949a.

UNIVERSIDADE FEDERAL DO RIO DE JANEIRO. Arquivo PROEDES: CAP 062 LIC 009. *Programa de Didática Especial de Química de 1942*. Rio de Janeiro: Arquivo da Faculdade de Educação, Centro de Documentação PROEDES, 1942.