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LEGAL FRAMEWORK FOR THE TRAINING OF MATHEMATICS TEACHERS IN BRAZIL: A HISTORICAL ANALYSIS

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Abstract: This article analyzes the historical and normative trajectory of teacher training in Brazil, with an emphasis on the initial training of mathematics teachers. It adopts a historical-critical approach that understands teaching as a social and political construct marked by ruptures, continuities, and institutional reorganizations. The analysis covers the main legal milestones from the imperial period to contemporary curriculum guidelines, highlighting recurring tensions between specific and pedagogical training, centralization and decentralization of educational policies, and social demands for quality education. Finally, the current challenges of teacher training are discussed in light of the technological, curricular, and social transformations that are affecting mathematics education.

Keywords: teacher training; mathematics degree; educational legislation; public policies; history of education.

Introduction

Teacher training in Brazil is a field that has historically been marked by political disputes, educational reforms, and epistemological transformations that continually redefine the social role of teaching. Throughout the 19th, 20th, and 21st centuries, successive laws have sought to organize the teaching profession, shaping curricula, training institutions, and professionalization models. In the case of mathematics, these transformations take on additional complexity due to the specificities of mathematical knowledge and the historical tensions between academic mathematics and school mathematics.

Understanding this trajectory requires abandoning linear and evolutionary readings. According to the Foucauldian perspective, the history of educational discourses is marked by discontinuities, reorganizations, and disputes over rationality that redefine what can be said and legitimized in each historical period. Thus, teacher training should be understood as the result of discursive rearrangements that articulate social projects, state interests, and educational demands.

In this context, this article aims to analyze the evolution of teacher training legislation in Brazil, with a specific focus on the training of mathematics teachers, highlighting historical continuities, ruptures, and contemporary challenges. By privileging the analysis of legal frameworks, we seek to understand how educational policies have produced different conceptions of teachers, curricula, and pedagogical practice over time.

Educational legislation not only regulates the organization of training courses, but also expresses societal projects and expectations about the role of schools in the construction of the country's social and economic development. Thus, investigating the normative evolution of teacher training in mathematics allows us to identify continuities and changes that help explain challenges that are still present, such as curriculum fragmentation, the articulation between theory and practice, the integration of digital technologies, and the need for critical and contextualized training in the face of the contemporary demands of Brazilian basic education.

From imperial instruction to Normal Schools: the first contours of teaching

The institutionalization of teacher training in Brazil has its roots in the imperial period, when the state began to structure elementary public education. The Law of October 15, 1827, represented a fundamental milestone by determining the creation of elementary schools throughout the Empire, defining basic content such as reading, writing, arithmetic, and geometry concepts. Although it did not create a formal teacher training system, the law signaled the state's concern with the organization of public education.

The Additional Act of 1834 further developed this organization by transferring responsibility for primary and secondary education to the provinces. This decentralization allowed for the creation of the first Normal Schools, which began to play a central role in teacher training. However, provincial autonomy also accentuated regional inequalities, as the quality of training depended on local economic and political conditions.

During the republican period, Normal Schools expanded and consolidated teaching as an institutionalized profession. State reforms, especially in São Paulo, sought to modernize teacher training by introducing model schools and teaching practices considered innovative for the time. Even so, mathematics training remained restricted to elementary content, reflecting pedagogical concepts centered on memorization and discipline.

The consolidation of Normal Schools must be understood within the context of a broader project of Brazilian nation building. Education came to be seen as a strategic tool for the moral, civic, and cultural education of the population, in line with the republican ideals of order and progress. In this scenario, primary school teachers assumed a fundamental role as agents for the dissemination of social and political values, which contributed to the growing appreciation of specific training for teachers.

This scenario shows that the institutionalization of teacher training occurred in a simultaneously progressive and limited manner, because, although specific institutions for teaching were created, the absence of coordinated national guidelines prevented the consolidation of a homogeneous training system. As Saviani (2012, p. 128) observes, "the organization of public schools in Brazil was slow, uneven, and deeply marked by the political and economic conditions of each historical period." This observation helps us understand why teacher training colleges, despite their importance, were unable to overcome regional inequalities or establish a common training standard at the national level.

In addition, the curriculum structure of these institutions reflected a conception of teaching strongly linked to the transmission of content and the moral education of students. In this context, teachers were understood above all as agents of social order, responsible for spreading values considered essential to the consolidation of republican society. Nóvoa (1992) points out that the teaching profession during this period was strongly influenced by the state, which sought, through schools, to consolidate a project for society based on discipline, morality, and cultural homogenization. For the author, "the professionalization of teachers cannot be understood without considering

the state's strategies for regulating and controlling the work of teachers" (NÓVOA, 1992, p. 19).

Despite institutional expansion, teacher training remained strongly normative and moralizing. The curricula of teacher training colleges emphasized discipline, the organization of school work, and the formation of habits considered appropriate for social life. In this context, the teaching of mathematics was conceived as an instrument for developing order, precision, and rationality, and was associated with the formation of logical thinking and preparation for practical activities in everyday life. However, the pedagogical approach remained strongly based on repetition, memorization, and the mechanical application of procedures, characteristics that marked Brazilian school culture for a long period.

Another relevant aspect of this period refers to the feminization of primary school teaching. From the end of the 19th century onwards, teaching became progressively associated with women's work, a phenomenon related both to social conceptions about the care and education of children and to government cost-cutting policies. The massive influx of women into teacher training colleges redefined the profile of the teaching profession and contributed to the construction of a professional identity marked by moral, emotional, and pedagogical dimensions. This process had a direct impact on the mathematics training offered to teacher trainees, which was often considered sufficient only for teaching the early grades, thus limiting the conceptual depth of the discipline.

At the same time, the absence of a coordinated national teacher training system meant that heterogeneity remained a central feature of the period. States with greater economic development were able to establish more stable institutions and more consistent curricula, while other regions faced difficulties in keeping training schools running regularly. This historical inequality would later influence the organization of teacher training at the higher education level.

With specific regard to the teaching of mathematics, it can be observed that the discipline assumed a strategic role in school education, being associated with the development of rationality, precision, and logical thinking. However, the way in which this teaching was conceived remained strongly marked by traditional practices. Libâneo (1994, p. 78) points out that "traditional teaching is characterized by the centrality of the teacher, the verbal transmission of content, and the emphasis on memorization as the main learning strategy." This perspective helps to understand why mathematics training in teacher training colleges favored operational procedures and repetitive exercises, to the detriment of conceptual understanding.

The feminization of teaching, in turn, also directly influenced the curriculum organization and social value of the profession. As Tanuri (2000, p. 68) points out, "the expansion of female teachers was associated with the idea of vocation, care, and dedication, attributes socially linked to the role of women." This process contributed to the construction of a teaching identity marked by affective and moral dimensions, while reinforcing the salary and professional devaluation of the career.

At the end of the initial republican period, teacher training was institutionally consolidated, but still far from an integrated and professional model. The lack of ar-

ticulation between specific and pedagogical knowledge, curricular fragmentation, and regional inequalities created a situation that would require profound reformulations in the following decades. As Saviani (2012, p. 142) summarizes, "the foundations of teacher training had been laid, but structural challenges remained that would only be addressed with the entry of universities into teacher training." These conditions paved the way for the transition from normalist training to higher education, a process that would profoundly redefine the field of teacher training in Brazil.

Thus, at the end of the 19th century and the beginning of the 20th century, teacher training was institutionalized, but still marked by fragmentation, regional inequalities, and limited articulation between pedagogical knowledge and specific knowledge. These elements would form the basis on which the educational reforms of the following decades would be structured, seeking to progressively transfer teacher training to the university sphere.

University training and curricular fragmentation

The transition of teacher training to the university setting, which began in the 1930s and 1940s, cannot be understood in isolation, as it is deeply connected to the political, social, and educational transformations that took place in Brazil throughout the 20th century. This movement represented an attempt to redefine teaching as a higher education profession, linking it to scientific production and the development of academic knowledge. At the same time, it gave rise to structural tensions that would remain present in teacher training programs for decades, especially the fragmentation between specific training and pedagogical training.

The creation of Brazilian universities, such as the University of São Paulo in 1934 and the University of Brazil in 1937, marked the emergence of a new paradigm of teacher training. In this scenario, mathematics came to be conceived as an autonomous scientific field, influenced by European trends that emphasized formal rigor and theoretical abstraction. The presence of foreign mathematicians contributed decisively to the consolidation of this academic culture, strengthening the idea that scientific training should precede pedagogical training. This perspective culminated in Decree No. 1,190 of 1939, which established the National Faculty of Philosophy and formalized the training of teachers for secondary education at the higher education level.

The curriculum model that emerged from this process became known as "3+1": three years dedicated to a bachelor's degree and one year devoted to pedagogical training. Although it represented progress by inserting teaching into the university space, the model consolidated an implicit hierarchy between disciplinary knowledge and pedagogical knowledge, reinforcing the separation between mathematical knowledge and teaching practice. This organization had lasting effects, contributing to the construction of fragmented curricula and the distancing between universities and elementary schools. The consolidation of this model coincided with the strengthening of a university culture based on disciplinary specialization. Academic mathematics began to value abstract structures, formalization, and logical rigor, aligning itself with international trends in the field. However, this move-

ment widened the gap between the mathematics produced at the university and that taught in elementary schools, hindering the articulation between content and pedagogical practices.

In the 1960s, the Federal Council of Education sought to promote greater standardization of teacher training through Opinion No. 292 of 1962, which proposed reorganizing pedagogical training and bringing it closer to specific training. However, the most profound structural changes would occur after the University Reform of 1968, which reorganized Brazilian higher education based on departmentalization, the creation of basic cycles, and the institutionalization of graduate studies. This reform reinforced the separation between bachelor's and teaching degrees, consolidating distinct educational paths and increasing curricular fragmentation.

In mathematics courses, departmentalization strengthened the centrality of abstract and formal content, aligned with international academic mathematics. At the same time, teacher training remained concentrated in education colleges, with little curricular integration. This institutional arrangement deepened the dichotomy between theory and practice and contributed to the construction of a professional identity marked by the separation between mathematical knowledge and pedagogical knowledge.

The 1960s and 1970s were also marked by the rise of technical educational policies, strongly influenced by the political context of the military regime. Education came to be conceived as an instrument of economic development, and teacher training was reorganized according to principles of efficiency, productivity, and rationalization. Law No. 5,692 of 1971 established short teaching degrees, with reduced duration and training aimed at rapid entry into the labor market. This model sought to respond to the rapid expansion of enrollment in basic education, but resulted in the deterioration of teacher training. In mathematics courses, the reduction in the number of hours devoted to specific and pedagogical content compromised conceptual depth and reinforced mechanistic approaches to teaching. The period was also marked by the spread of the Modern Mathematics Movement, which introduced formal language and abstract structures into the school curriculum, but met with resistance due to insufficient teacher training.

The expansion of higher education in the 1970s and 1980s broadened access to teacher training, especially with the spread of universities to the interior of the country. However, in many cases, this expansion occurred without strengthening the structural conditions necessary to ensure training quality, reproducing the historical fragmentation between content and pedagogical practices . The redemocratization of the country, beginning in the 1980s, ushered in a new phase of critical review of educational policies. Academic movements and professional entities began to question the technocratic legacy and advocate for critical, reflective, and socially committed teacher training. In the field of mathematics education, research intensified, highlighting the gap between academic mathematics and school mathematics, as well as the need to integrate theory, practice, and research.

The National Education Guidelines and Framework Law, enacted in 1996, represented a decisive milestone in this restructuring process. The legislation established higher education as a requirement

for working in basic education, definitively replacing short teaching degrees and reaffirming the inseparability of theory and practice. The LDB also introduced principles that valued research, pedagogical practice, and the articulation between universities and basic schools. This new legal framework inaugurated a phase of reorganization of teaching degrees, with an emphasis on teacher professionalization and curricular integration. In the case of mathematics, it opened space for reformulations that sought to overcome historical fragmentation, bringing together specific content, pedagogical foundations, and teaching practices.

Thus, the path from initial university training to the reforms of redemocratization reveals a complex movement, marked by institutional advances, structural permanence, and epistemological tensions. The history of teacher training during this period reveals the coexistence of different educational projects, sometimes guided by technical rationalities, sometimes by critical perspectives, shaping a field in constant transformation.

Curriculum guidelines and teacher professionalization

The consolidation of the National Curriculum Guidelines (DCNs) in the early 2000s represented a decisive moment in the process of reconfiguring teacher training in Brazil, especially in the field of mathematics degrees. More than establishing minimum parameters for the organization of courses, these guidelines promoted a significant conceptual shift in the very meaning of training teachers for basic education. The historical logic of separating specific content from pedagogical training was gradually broken, giving way to an integrated concept of training, in which mathematical knowledge, educational foundations, and teaching practice should constitute an articulated, continuous, and reflective path.

This movement did not arise in isolation, but as a response to a long history of criticism of the fragmented model of teacher training that had become established throughout the 20th century. Academic research and educational debates began to show that the dissociation between theory and practice, between university and basic school, made it difficult to build solid professional identities committed to the Brazilian educational reality. Thus, the DCNs began to emphasize teaching as a complex social practice, situated in specific historical, cultural, and institutional contexts, requiring teachers not only to master content, but also to have the capacity for critical analysis and pedagogical intervention.

In this new scenario, practice as a curricular component began to occupy a central position in initial training. Unlike the traditional model, which concentrated practical experience only in final supervised internships, the DCNs began to require that practice be present throughout the entire degree program, enabling progressive and systematic contact with the reality of schools. This change was a direct response to criticism of the "3+1" model, whose fragmentation made it difficult to build a professional teaching identity. By incorporating practice from the beginning of the course, the aim was to encourage reflection on teaching, bring teacher training students closer to the real challenges of school, and strengthen their understanding of teaching as a complex, situated, and socially committed activity.

This expansion of the presence of practice in initial training also contributed to the valorization of elementary school as a formative space. Schools were no longer seen only as places for applying theories produced at the university and came to be recognized as environments for the production of pedagogical knowledge. This change reinforced the importance of partnerships between training institutions and school networks, stimulating collaborative projects, applied research, and shared training.

Another significant advance was the incorporation of research as a structuring axis of training. Research is no longer understood as an activity restricted to postgraduate studies and has become part of initial training as a constitutive dimension of professional teacher development. This perspective has valued the investigative stance of teachers, encouraging critical analysis of educational problems, the production of pedagogical knowledge, and systematic reflection on their own practice. In the field of mathematics, this orientation contributed to the strengthening of mathematics education as an area of research and stimulated the creation of curricular components focused on teaching the discipline, the history of mathematics, problem solving, and the pedagogical use of digital technologies.

The valorization of research also contributed to broadening the understanding of teachers as intellectuals who produce knowledge about their practice. This conception breaks with the traditional view of teachers as mere executors of curricular prescriptions, reinforcing the idea that pedagogical work involves ongoing investigation, analysis of contexts, and informed decision-making.

The 2002 DCNs also defined specific competencies for mathematics teachers, broadening the understanding of teaching as a complex professional practice. Among these competencies, the following stand out: conceptual mastery of the subject area, the ability to communicate mathematical ideas, understanding of learning processes, and the pedagogical use of technologies. Mathematics came to be understood not only as a set of contents to be transmitted, but as a social practice that needs to be contextualized and articulated to the needs of basic education. This change signaled a shift from training focused exclusively on content to training oriented toward understanding the teaching and learning of the discipline.

Throughout the 2000s, public policies aimed at enhancing the status of teachers reinforced this trend toward professionalization. Among these policies, the Institutional Program for Teaching Initiation Scholarships (PIBID) and the National Plan for the Training of Basic Education Teachers (PARFOR) stand out. PIBID, created in 2007, played a key role in promoting the early insertion of teacher training students into public schools, strengthening the link between universities and basic education. In the case of mathematics, the program has fostered the development of innovative teaching practices, collaborative work, and reflection on the teaching of the subject. PARFOR, established in 2009, sought to address the historical shortage of adequately trained teachers by offering degree courses to practicing teachers without specific training, thereby expanding access to higher education, especially in historically underserved regions.

The approval of the National Education Plan in 2014 reinforced the centrality of teacher training by establishing goals related to the universalization of higher education,

the expansion of continuing education, and the valorization of the teaching career. These goals prompted training institutions to review their pedagogical projects and strengthen partnerships with education networks, consolidating teacher professionalization as a priority of educational policies.

In this restructuring movement, Resolution CNE/CP No. 2/2015 represented a new milestone by proposing a curriculum based on three articulated training cores: educational foundations, specific deepening, and pedagogical practice. The regulation increased the workload of teaching degrees and reinforced the inseparability of theory and practice, consolidating the concept of integrated training. In mathematics courses, this guideline encouraged a greater focus on specific teaching methods, problem solving, and reflection on learning processes.

The publication of the National Common Core Curriculum (BNCC) in 2017 and 2018 inaugurated a new stage of curricular reorganization by establishing a national curriculum guided by competencies and skills. This change had a direct impact on teacher training programs, which came under pressure to align teacher training with the competencies required for basic education. In the case of mathematics, the definition of thematic units, specific competencies, and learning progressions required profound curricular reformulations in teacher training courses.

The creation of the Pedagogical Residency Program in 2018 expanded the placement of teacher education students in schools, strengthening professional immersion experiences and complementing PIBID actions. This program consolidated teaching practice as the central axis of training and favored the development of the professional identity of future teachers.

Resolution CNE/CP No. 2/2019 intensified the alignment between teacher training and the BNCC by adopting an approach focused on professional competencies, redefining the graduate profile, and reorganizing practice as a curricular component in terms of progressive immersion. However, this regulation also generated criticism in the academic field, especially regarding the risk of excessive standardization and the possible reduction of the autonomy of training institutions.

In the field of mathematics, the impacts were significant, as mandatory alignment with the BNCC required profound reformulations in specific content, teaching methodologies, and supervised internships, intensifying debates about the balance between conceptual rigor, broad training, and regulatory requirements.

Thus, the period of the Curriculum Guidelines and teacher professionalization policies reveals a complex movement, marked by significant advances in curriculum integration, strengthening of practice, and valorization of teaching, but also by tensions arising from the growing alignment between initial training and national curriculum policies. These transformations highlight the continuing historical challenge of balancing university autonomy, training quality, and the demands of the Brazilian educational system.

Recent transformations and new challenges

Recent transformations in teacher training, which have intensified since 2020, hi-

ghlight an important turning point in the historical trajectory analyzed throughout this work. The COVID-19 pandemic, by causing the suspension of face-to-face activities and the emergency adoption of remote teaching, has highlighted structural weaknesses previously pointed out in the literature, especially with regard to the technological training of teachers and the articulation between specific knowledge, teaching methods, and digital resources. This scenario revealed that the integration of technology and teaching, although already provided for in previous curriculum documents, had not yet been fully incorporated into initial teacher training.

In the case of mathematics teacher training, these weaknesses became even more evident. The need to use virtual learning environments, mathematical software, digital assessment platforms, and dynamic visualization resources required skills that had not always been developed during initial training. This situation reinforced diagnoses already present in research in the field, which pointed to the need to integrate digital technologies as a constitutive element of teacher training, rather than as a complementary resource. The pandemic experience, therefore, acted as a catalyst for change, accelerating processes that were already underway and broadening the recognition of technology as an indispensable dimension of contemporary teaching.

At the same time, the intensified use of technology has brought new pedagogical challenges. It is not just a matter of mastering digital tools, but of understanding how they transform the nature of teaching and learning mathematics. Dynamic geometry environments, modeling software, simulators, and adaptive platforms expand the possibilities for investigation, experimentation, and problem solving, requiring teachers to have the critical ability to select, evaluate, and integrate these resources in a pedagogically meaningful way. Thus, teacher training now demands a deeper integration of mathematical knowledge, didactic fundamentals, and technological skills.

In this context, Resolution CNE/CP No. 4/2024 reaffirms fundamental principles of teacher training, highlighting the articulation between theory and practice, the inseparability and interdependence between teaching, research, and extension, the commitment to inclusion and respect for diversity, and the pedagogical use of digital technologies. The proposed curriculum organization into four training areas—general training, specific in-depth training, extension, and supervised internship—seeks to strengthen the integration between universities and elementary schools and consolidate practice as a structuring axis of training.

The emphasis on university extension represents a particularly relevant aspect of the most recent guidelines, as it broadens the understanding of teacher training as a process that develops in dialogue with the community and with the educational reality. By promoting training activities in real contexts, extension contributes to bringing the university closer to social demands and strengthening the public dimension of teacher training.

Despite these regulatory advances, historical challenges remain in the training of mathematics teachers. Curricular fragmentation between specific and pedagogical knowledge, although progressively questioned, is still evident in many training institutions. Similarly, the gap between academic mathematics and school mathematics

remains a sensitive issue, requiring training proposals capable of articulating conceptual rigor and understanding of teaching practices.

Another persistent challenge relates to the regional inequalities that have marked Brazilian education since the imperial period. The availability and quality of teacher training courses vary significantly between regions, reflecting socioeconomic and structural inequalities that directly impact teacher training opportunities. This reality reinforces the need for public policies that consider regional specificities and promote equitable training conditions.

In addition, the growing social and cultural diversity of Brazilian schools requires teacher training that is sensitive to issues of inclusion, equity, and social justice. The work of mathematics teachers now demands skills related to serving students with different educational needs, sociocultural contexts, and learning trajectories, increasing the complexity of teaching.

The intensification of debates on competencies, driven by the BNCC and recent guidelines, also brings new tensions to the field of teacher training. On the one hand, the definition of competencies seeks to bring initial training closer to the demands of basic education; on the other hand, it raises concerns about excessive standardization of training and the preservation of the autonomy of training institutions. This debate highlights the need to balance national guidelines and institutional diversity, preventing teacher training from being reduced to prescriptive models.

In this scenario, continuing education takes center stage as an indispensable dimension of professional teacher development. Rapid technological, curricular, and social changes make it clear that initial training, although fundamental, is not sufficient to meet contemporary demands. Lifelong learning becomes an essential requirement for the ongoing updating of teachers.

Thus, recent transformations show that teacher training in mathematics is undergoing a process of continuous reconfiguration. The incorporation of digital technologies, the valorization of diversity, the integration between universities and elementary schools, and the strengthening of practice as a formative axis are trends that point t ting new formative horizons. At the same time, the persistence of historical challenges indicates that the construction of an integrated, critical, and socially committed training model remains an ongoing task, requiring constant reflection and institutional commitment to the quality of education.

Final considerations

The historical and normative analysis developed throughout this work allows us to affirm that the training of mathematics teachers in Brazil is a complex field, marked by structural continuities, paradigmatic ruptures, and successive attempts at institutional reorganization. Far from being a linear path, this trajectory reveals a movement marked by tensions between educational projects, political interests, social transformations, and epistemological changes that redefine, in different periods, the place of the teacher and the meaning of teaching.

When revisiting the main legal milestones from the 19th century to the present day, it is clear that teacher training has always been deeply linked to the historical contexts and social demands of each era. From

the initial organization of public education in the Empire, through the expansion of Normal Schools, the transfer of teacher training to the university level, the technical reforms of the military period, to contemporary curriculum guidelines, it is clear that each piece of legislation sought to respond to specific problems of its time. However, it is also evident that many issues remain recurrent, reappearing in new forms over the decades.

Among these historical continuities, the fragmentation between specific mathematical training and pedagogical training stands out. From the "3+1" model, institutionalized in 1939, to the current debates on competencies and curricular integration, the articulation between disciplinary knowledge and didactic knowledge remains a central challenge for teacher training in mathematics. Although the National Curriculum Guidelines have sought to overcome this dichotomy by emphasizing practice as a continuous curricular component and research as a formative axis, the effective implementation of integrated models still faces institutional, cultural, and structural obstacles.

Another recurring element refers to the historical distance between academic mathematics and school mathematics. Throughout the 20th century, the consolidation of university mathematics, strongly influenced by international theoretical currents, contributed to raising the scientific rigor of training, but also widened the gap between the knowledge produced at the university and the concrete needs of elementary schools. This tension remains current and requires training that articulates conceptual depth and pedagogical sensitivity, recognizing mathematics as a scientific field and as a social practice.

The analysis also shows that teacher training was deeply influenced by different educational rationales. In certain periods, technical and instrumentalist perspectives prevailed, which understood education as a mechanism for rationalization and productivity. At other times, critical and reflective approaches gained strength, valuing the social role of schools and teacher autonomy. The coexistence of these perspectives demonstrates that teacher training remains a field of theoretical and political disputes, in which different educational and social projects clash.

In the contemporary scenario, new challenges are added to the historical ones. The incorporation of digital technologies, intensified by the COVID-19 pandemic, has highlighted the need to expand teachers' technological training, especially in mathematics education, an area that has a vast repertoire of digital tools for research, modeling, and visualization of concepts. At the same time, the country's growing cultural and social diversity requires training that is sensitive to issues of inclusion, equity, and social justice, preparing teachers to work in heterogeneous and challenging contexts.

The most recent legislation, such as the BNCC, the 2015 and 2019 Curriculum Guidelines, and CNE/CP Resolution No. 4/2024, signal efforts to strengthen the integration between initial training and the demands of basic education. However, they also raise important debates about university autonomy, curriculum standardization, and the balance between critical training and normative prescription. These debates show that teacher training remains a work in progress, requiring ongoing reflection and acti-

ve participation from training institutions, teachers, and the academic community.

Given this scenario, it is clear that overcoming the historical challenges of teacher training in mathematics depends not only on new legislation, but also on consistent public policies, structural investment, and institutional commitment to quality education. Effective integration between universities and elementary schools, strengthening research in mathematics education, valuing the teaching profession, and ensuring adequate working conditions are indispensable elements for the advancement of professional training.

Finally, understanding the normative evolution of mathematics teacher training in Brazil allows us to recognize that the field is in constant transformation. The dialogue between tradition and innovation, between specific knowledge and pedagogical practice, between academic autonomy and social demands, is a necessary horizon for the construction of more consistent, critical, and socially committed training models. Thus, the consolidation of solid and contextualized teacher training remains an essential condition for strengthening mathematics education and promoting quality basic education in the country.

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