ARITHMETIC IN RIO GRANDE DO SUL PRIMARY SCHOOLS IN THE FIRST HALF OF THE 20TH CENTURY: PRESCRIBED TEACHING

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Abstract

Since the proclamation of the Republic, in Brazil, in 1889, until the enactment of the Organic Law on Primary Education in 1946, the norms on primary schooling were on the responsibility of the states that make up the federation. The text examines the norms established in this period, in the state of Rio Grande do Sul, in the period known as the First Republic (1889-1930) and in the period named Era Vargas (1930-1945), focusing on the specifications concerning the teaching of Arithmetic. Connections are established between the programmatic and methodological guidelines for the Arithmetic and government policies of expansion, modernization, planning, and control of primary education.

Key-words: history of education, history of school subjects, primary school, arithmetic, mathematics education.

ARITMÉTICA NAS ESCOLAS PRIMÁRIAS GAÚCHAS NA PRIMEIRA METADE DO SÉCULO 20: O ENSINO PRESCRITO

Resumo

Da proclamação da República, no Brasil, em 1889, até a decretação da Lei Orgânica sobre o Ensino Primário, em 1946, as normatizações sobre o ensino primário foram incumbência dos Estados que compunham a federação. Neste texto examinam-se as normatizações estabelecidas, neste período, no Estado do Rio Grande do Sul, no período conhecido como Primeira República (1889-1930) e na chamada Era Vargas (1930-1945), enfocando as prescrições relativas ao ensino da Aritmética. São estabelecidas conexões entre as orientações programáticas e metodológicas para a Aritmética e as políticas governamentais de expansão, ordenamento, modernização e controle do ensino primário.

Palavras-chave: história da educação, história das disciplinas escolares, ensino primário, aritmética, educação matemática.

ARITMÉTICA EN LAS ESCUELAS PRIMARIAS DE RIO GRANDE DO SUL EN LA PRIMERA MITAD DEL SIGLO 20: LA ENSEÑANZA PRESCRITA

Resumen
Desde la proclamación de la República, en Brasil, en 1889, hasta la promulgación de la Ley Orgánica de Educación Primaria en el año 1946, las normas acerca de la educación primaria estuvieron en la responsabilidad de los Estados que componen la federación. El texto examina las normas establecidas en este periodo, en el Estado de Rio Grande do Sul, en el período conocido como la Primera República (1889-1930) y en la Era Vargas (1930-1945), centrándose en las prescripciones para la enseñanza de la Aritmética. Se establecen conexiones entre las líneas programáticas y metodológicas para la Aritmética y las políticas gubernamentales de expansión, modernización, planificación y control de la educación primaria.
Palabras-clave: historia de la educación, historia de las materias escolares, escuela primaria, aritmética, educación matemática.

L'ARITHMÉTIQUE DANS LES ÉCOLES PRIMAIRES DE L'ÉTAT DU RIO GRANDE DO SUL DANS LA PREMIÈRE MOITIÉ DU VINGTIÈME SIÈCLE: L'ENSEIGNEMENT PRÉVU

Résumé
Depuis la proclamation de la République au Brésil, en 1889, jusqu'à la promulgation de la Loi organique sur l'enseignement primaire en 1946, les normes sur l'enseignement primaire furent la responsabilité des États qui composent la fédération. Le texte examine les normes établies dans cette période, dans l'état du Rio Grande do Sul, dans la période dite de la Première République (1889-1930) et la période nommée Era Vargas (1930-1945), en mettant l'accent sur les prescriptions pour l'enseignement de l'Arithmétique. Des connexions sont établies entre les lignes programmatiques et méthodologiques pour l'Arithmétique et les politiques gouvernementales pour le développement, la modernisation, la planification et le contrôle de l'enseignement primaire.
Mots-clé: histoire de l'éducation, histoire des disciplines scolaires, primaire, arithmétique, l'enseignement des mathématiques.

The studies on the establishment of primary education in Rio Grande do Sul, in the 19th and 20th centuries, have focused, above all, the educational policies that were implemented and the teachers' education processes. Studies investigating the school practices are less frequent and very few are focused on the Arithmetic or Geometry teaching in primary schools.

The research project entitled *The establishment of mathematics elementary knowledge: Arithmetic, Geometry, and Drawing in the primary education in a historic-comparative perspective*, which began in 2013 under the coordination of Wagner Valente Rodrigues, has as a goal to analyze the trajectory of the establishment of Arithmetic, Drawing, and Geometry teaching in different Brazilian states in a historic-comparative perspective. In Rio Grande do Sul, a regional subproject was established[1] dedicated to the investigation on the education of Arithmetic in primary schools of the state in the Republican period.

The first step of the research was dedicated to the inventory of the legislation referring to the primary education[2] in the period ranging from the proclamation of the Republic to the approval of the decree-law n. 8.529 of January 2nd 1946, known as the Organic Law on Primary Education. The period comprises the First Republic, when the states of the federation, originating from the old Provinces of the Empire, had wide autonomy and established the primary education standardization, and the Era Vargas, during which, although all the efforts for implementation of a centralized educational policy, the organization of the primary education still followed its ways and ruling in the different states.

The regional team was responsible, therefore, for the inventory and study of the legislation that standardized the primary education in Rio Grande do Sul from 1889 to 1946. A reading of the documents, which looked arid in a first approach, and "limited for the understanding of the practices carried through and the effective functioning of education in the school institutions" was necessary, as Souza argues (2012), for the understanding of the "established rationalities and the attempts of the Public Authority to order and configure the teaching" (p. 27).

The analysis of the documents was illuminated by the study of the considerations and reconstructions already developed by historians, who had looked at the primary education in Brazil and Rio Grande do Sul as an object of investigation. This collating between the analysis of the state legislation and results of historical studies already developed allowed the writing of the initial draft, presented here, of a picture of the official prescriptions referring to the teaching of Arithmetic in primary education, in the first half of the 20th century, in Rio Grande do Sul.

Primary education in the state at the beginning of the Republic

The government of Rio Grande do Sul was, throughout the First Republic, conducted by the Rio-Grandense Republican Party - PRR - which, armed with a positivist program

[1] In Rio Grande do Sul the research is co-ordinated by this paper's author and the teachers Maria Cecilia Bueno Fischer, from Unisinos, and Monica Bertoni dos Santos, from PUCRS.

[2] The legislation mentioned in the text is accessible at https://repositorio.ufsc.br/handle/123456789/98894. The data collection and the digitizing were accomplished by the Scientific Initiation scholarship holders Fernando Augusto Braun Peixoto, from Ufrgs, and Jose Henrique de Oliveira, from PUCRS.

and representing a wide political block, conquered the government from the traditional rulers supported by the farmers and jerked beef manufacturers (Fonseca, 1993). In spite of the opposition of the federalists and the crises deflagrated in 1893 and 1923, the PRR conquered a relative political stability which allowed, according to Herrlein (2002), the implementation of a project of modernization of society and the economy, which had the investment in education as one of its vectors.

At the end of the Empire, the public education in Rio Grande do Sul was sparse and unsystematic. The majority of the primary schools in the state were private. There was a network of schools created by the Italian and German immigrants, especially in the colonial region, or kept by the municipalities (Peres, 2000). In 1889, according to Giolo (1994), among the 618 public classes that were created, only 385 were running. Among those classes, half were aimed at male students, about one fourth to female ones and the remaining were mixed. The facilities were precarious, and the classes were opened and closed due to different reasons: the demand by the families was short, and the attendance was irregular, even though the legislation determined that it was mandatory from the age of 7 to 15 years-old.

The recruiting of teachers was done by means of a range of strategies, which included selection processes, appointment of the best students as monitors – adjunct teachers -, and pedagogical conferences, besides the graduation by the Teachers School, created in 1869. Werle (2008) observes that the Teachers School, in the 19th century "was not established as a specific and differentiated institution from the other secondary education ones, with a clearly and technically structured curriculum with the objective of teacher's professionalization" (p. 141). In 1878 only 3.5% of the public chairs were provided with Teachers School graduates.

The legislation determined the organization of the primary education in levels. The first level education was intended as mandatory and should be offered in all the localities, indistinctly. According to the report of the vice-president of the Province to the Provincial Council, in 1857,

> the first level education, therefore, comprises the notions that no man can ignore, without harm to himself and danger to the society. As the second level is more developed, it qualifies the boy to reach the point where specific dispositions for the classic studies themselves, or any profession, can be manifested. (apud Giolo, 1994, p. 37-38)

The Arithmetic to be taught in the first level schools was quite simple, limited to the four operations with "whole numbers lower than one hundred" and "elementary notions about the name and use of metric measures" (Act n. 141/1883, apud Arraiada; Tambara, 2004, p. 314). The second level education was more advanced, and, in the case of Arithmetic, extended to the fractions, ratios and proportions, interests and discounts. In 1883 only thirteen towns, besides the capital, had second level schools.

When the Republic was set up, the reorganization process of the administrative apparatus was delayed by the Revolution Federalist, which lasted from 1893 to 1895. The reorganization of the public education began in 1897, with the revision of the teachers' wage (Rio Grande do Sul, 1935). From then on, the public and popular instruction, considered as "one of the propeller springs of the social progress" (Bastos, 1994, p. 4),

was the target of a consistent expansion policy. According to Levine (apud Herrlein, 2002, p. 15), in this period education headed the public expenses - except in war times -, and the governments of the state spent a higher fraction of the income with education than the São Paulo and Minas Gerais governments did.

According to Corsetti (1998), the primary education was the main target and instrument of intervention of the PRR governments in the education field. The regulations and programs established in this period reveal, according to the author, the efforts of pedagogical standardization, administrative centralization, and control on the public education, with the preservation of the freedom granted to the private initiative.

The decree n. 89, from 1897, reorganized the primary education in the state in Republican models: “free, lay, and free of cost” (art. 1). The decree established the existence of elementary schools, all of the same level, and district schools. The decree n. 130, from 1898, organized the education of the elementary schools in three classes, each one with two sections, and the teacher should classify the students at the beginning of each school year, according to their “level of learning” (art. 2).

The decrees announced, therefore, an ambitious project of extended and homogeneous primary education, of wide access, and with a program that comprised the notions that before were assigned to the first and second levels.

The district schools, on their turn, were institutions idealized to be established in the capital of the state and other municipalities to provide more advanced teaching, having a library and the “indispensable material to the practical education of the respective course” (art. 4 of decree n. 89 of 1897). The education in the schools should be organized in three successive classes, where Portuguese and Mathematics prevailed, each one with six weekly hours (decree n. 385 of 1901). The existing schools were converted, in 1906, into complementary schools, of “practical and professional character, aiming to develop the elementary education and to prepare the candidates for the primary public teaching” (state decree n. 874 of 1906).

The state government intended to constitute a specialized teaching, dedicated to the education of teachers. In 1909, however, the decree n. 1.479 warned in its preamble that the existing complementary schools did not fill “the goal for which they were created, except the one in the capital,” not being possible “to make them useful without radical modifications in the programs of those establishments.” Only the Complementary School of Porto Alegre, which was an heiress of the old Teachers School, dedicated to the education of teachers, was kept.

The decree n. 1.479 of 1909 extinguished the remaining complementary schools and created a new figure, the colégios elementares: urban schools, with classes organized by age and level of knowledge, gathering “as many teachers as [...] necessary" (art. 4 of decree n. 1.479 of 1909). The Circular n. 978 of June of 1914, determined that all the classrooms of the colégios elementares should be mixed and that the same education should be provided by the same teachers to boys and girls (Rio Grande do Sul, 1935).

In this same year, according to Luchese (2013), nine elementary schools were created from the gathering of isolated schools and the conversion of four complementary schools. The condition for the establishment of the schools was the cession of facilities by the municipalities. However, according to the author, these conditions remained, in general, precarious, at least until the decade of 1920.

In 1915, the grupos escolares were created in the state, as a gathering of classes, having to be attended by at least three teachers. The grupos escolares differed from the colégios elementares by the number of students: they were converted into colégios elementares when they reached 200 or more students, and the colégios elementares went back the condition of grupos escolares when this number fell below 200.

However, the isolated schools, heiresses of the old public classes, prevailed, in which one teacher only - in general a female one - provided to a group of children of different ages, in rented rooms, an education that can be presumed as quite elementary. The schools were classified according to entrances, being the new teachers assigned to the ones of first entrance, located in places that were more distant from the urban centers.

For Luchese (2013), the colégios elementares would have been the local version of the model called, in the rest of the country, as grupo escolar, because they offered a serial education, by the authority that was assigned to them, and because they were a teaching reference. The teachers of these schools enjoyed a higher social recognition, developing tasks in the expansion process, as the participation in final exam boards of isolated schools.

But it is important to notice that the conditions of these schools were very diverse from those of the *grupos escolares* in São Paulo, from 1893, by the gathering of preliminary schools, conducted by Teachers School graduates and endowed with a whole administrative apparatus (Souza, 2012). In Rio Grande do Sul, the education of teachers had been assigned to the Complementary School of Porto Alegre, but the detailed standardization of this education occurred in 1929 only, with the decree n. 4.277, which regulated the Teachers School and the complementary education in the state. According to Luchese (2013), many students of the colégios elementares became teachers following the conclusion of their studies, pointing the permanence of recruiting processes that avoided this institutionalized education.

Moreover, there is evidence that the education provided in the schools was not properly a serial education. Peres (2000) mentions a report from a school's principal, dated of 1927, who claimed the existence of individual education in the school she ran, in spite of the gathering of 13 teachers, as in one same classroom there were students from several levels. The Regulation of the Public Instruction of 1927 required the organization of education in three classes - lower, middle, and higher. However, it did not compel the unfolding of the classes in sections (article 27 of the decree n. 3.898 of 1927).

In 1927, the rate of schooling of Rio Grande do Sul had increased significantly, from about 23% in 1907 (Targa, 1996) to 73% of the population in the school age, according to data from the General Statistics Board of the Ministry of Agriculture, Industry, and Commerce. The levels were higher than in the other states: the rate for Paraná, São Paulo, and Federal District were 70%, 60%, and 50% respectively (Rio Grande do Sul, 1935).

But the isolated schools still prevailed: 1981 in the year of 1922. The numbers of municipal and private schools, respectively 540 and 427, were also expressive in this year (Araújo, 2012).

At the end of Borges de Medeiros government, in January of 1928, Rio Grande do Sul had 46 colégios elementares and 33 grupos escolares while São Paulo already had 289 grupos escolares (Souza, 2012). In the face of the other states, Rio Grande do Sul

was characterized by quite a fragmented education network. The serial education model, with classes organized according to ages and levels of knowledge, was spreading, though slowly.

Arithmetic in the programs of education during the First Republic

The decree n. 89 of 1897 stated that the elementary education should encompass "counting and calculating. Arithmetic practice until the rule of three by means of the use, first, of the spontaneous processes, and later of the systematic processes" and the "metric system preceded of the study of practical geometry (tacheometry)" (art. 5). The program for the elementary education stated in the decree n. 239 of 1899, included a study of Arithmetic, Practical Geometry, and Drawing.

In accordance with the positivist orientation and the modernizing and scientificist bias of the state administration, the internal regulation of the colégios elementares valued the teaching of Arithmetic and Geometry, determining the daily dedication of "three-quarters of an hour to arithmetic or practical geometry and to the exercises related to these subjects" (art. 4 of decree n. 130/1898).

The program for the teaching of Arithmetic projected a gradually complexified study of the numbers, beginning by the mental counting, adding, and subtracting, advancing to the multiplication and division, and to the algorithms of the operations in the slate or the blackboard, passing to the decimal and proper fractions, to the use of the decimal metric system, and advancing, in the third class, until the simple and compound rule of three, the extraction of the square and cubic root of whole, decimals, and fractional numbers.

The practical character assigned to the teaching of Arithmetic was explicit in the recommendation of the calculation with concrete numbers - representations of measures of the metric system or another quantifiable magnitude -, and in the reiterated orientation towards the resolution of practical problems. It was prescribed the study of "practical problems on the four operations in whole and decimal numbers, applying the reduction to the unit"; "application of the rules learned [on fractions] to practical problems"; "simple interests rule in practical problems; evaluation of interests, capital, tax, and time"; "simple and compound rule of society, in practical problems and application of the method of reduction to the unit"; "practical problems with the application of the square root" (decree n. 239/1899, p. 265, 268, 270, 271, 273).

The applications were extended to Geometry, in the case of the square root:

> Evaluation of the hypotenuse of a right triangle; evaluation of the area of a triangle, given the three sides; evaluation of the side of the square, given the area; evaluation of the radius and the diameter, given the area of the circle. (Decree n. 239 of 1899, p. 273)

The decree n. 1.575 of 1910 introduced small changes in this program. It indicated the recapitulation of contents: "widening of the knowledge on the two first operations"; "problems of recapitulation of the program of the first section" (decree n. 1.575 of 1910, p. 3, 13). It also suggested an abbreviated approach of some topics, when mentioning "rudiments of the two first operations" or "small practical problems on fractions" (decree n. 1.575 of 1910, p. 1, 7).

The decree n. 3.903 of 1927 reaffirmed the eminently practical character of the Arithmetic teaching: “Theory will be taught after the resolution of problems which, usually, the student will solve in life practices” (p. 540).

In spite of its practical character, the program for Arithmetic, in terms of the listed contents or objectives, was quite ambitious when compared to the program prescribed for the first level schools in the Imperial period. It comprised the four operations with proper and decimal fractions, the study of the ratios, the square and cubic roots. The predominance of education in isolated schools, until mid-1920, suggests, however that the program practiced in general was more modest than the prescribed one. The decision of the teachers of Instituto Júlio de Castilhos, in 1911, to create a primary course inside that institution, due to the precariousness of the education of the students who looked for the secondary course (Esperança, 2010, p. 32), is also an indication that the school learning did not correspond to the decreed programs.

Since the initial norms, the resource to the intuitive method was stated as an official determination, preceding the statement of the programs. The book should be used “to assist only” (art. 4 of decree n. 89 of 1897). In the same way as the official documents mentioned it, the intuitive method was opposed to the education based on the lecture and the repetition, and should be based more on the observation of the real things than in the listening to the teacher or the memorization of the written text:

> Art. 3 - The intuitive and practical method shall be adopted, starting by the observation of simple objects, later upgrading to the abstract idea, to the comparison, to the generalization, and to the reasoning, being forbidden any empirical teaching, established exclusively on memory exercises. (Decree n. 239 of 1899)

The appeal to the intuitive method was unfolded in several specific recommendations: in the resource to the mental calculation “first with the aid of the fingers, of little stones, of grains etc., later without this aid”; in the study of the “decimal metric system, using, whenever possible, an intuitive method: meter, square meter, cubic meter, liter, gram”; in the presentation of the proper fractions through the “idea of half, third, fourth etc. by intuitive means” (decree n. 239 of 1899).

The determination of the use of the intuitive method was reiterated in the decree n. 3.903 of 1927, in the text that almost reproduces the one of the 1899 decree:

> Art. 3 - The intuitive method will be constantly used, starting by the observation of simple objects, later upgrading to the abstract idea, to the comparison, to the generalization, and the reasoning, being forbidden any empirical teaching, exclusively founded on memory exercises.

The same decree n. 3.903 of 1927 stated that the teacher should explain orally and propose “practical questions to be solved by the students” (art. 5).

The reiterated calls to the use of the intuitive method in official documents indicate that, even though it had been recommended since the Imperial period, it had not penetrated into the school practices. The text of the Circular n. 1873 of January of 1916, from the Secretariat of the Interior and the Exterior, reveals that there was a persistent tendency of the teachers towards the book-based teaching:

> Teaching must have a practical, concrete, and the most intuitive and not abstract nor theoretical possible feature - in order to free the student from embarrassments in face of the simplest problem. There are children who analyze a piece of text logically with certain easiness and who, however, are incapable of reproducing it orally or by writing the same piece, and writing, with correction and sense, at least two lines. It is necessary that the teacher of the elementary school keeps himself within the program and keep in sight that he is not in the lower plan when providing to the students a solid education and abandoning programs that are more or less sumptuous, taking time from the utilitarian and practical aim of education. (apud Rio Grande do Sul, 1935, p. 247)

The mismatch between the prescribed and the practiced methods raises questions on the teachers' education. On the one hand, it can be guessed that the teachers used to reproduce the pedagogical methods that they had experienced as students, just like it happened in other moments and places. On the other hand, the hypothesis that the resource to the dictation and the memorization was used to hide the little easiness with the approached contents can be raised.

The candidates to the public teaching should, in accordance with the decree n. 3.975 of 1927, to be submitted to oral exams on each one of the subjects. The Mathematics program included, besides the arithmetic contents prescribed for elementary education, topics of Algebra, as quadratic and biquadratic equations, binomial of Newton, Cramer formulae, and other methods of resolution of equations systems. A trigonometry chapter was added to the geometry of the elementary education.

However, the decree n. 3.898 of 1927 clarified, in art. 82, that the students-teachers, originary from the complementary schools, were exempted from the theoretical tests in the selections for the places of effective teachers. And which Mathematics was comprised in complementary education?

The decree n. 1.479 of 1909 determined that the complementary education would enclose "Arithmetic, complete study; algebra until quadratic equations included; geometry in three dimensions" (article 9). The Arithmetic studied by the teachers, therefore, was the same one that they should teach, added with rudiments of algebra.

The decree n. 4.277 of 1929 established a new regulation, instituting the teachers' teaching to be offered in the Teachers School of Porto Alegre, and the complementary education, three years long, to be offered in public or equivalent complementary schools. In the program of the complementary course, Arithmetic appeared in each one of the three years, Algebra and Geometry in the second and the third years. It was also established a rigorous and complicated system of evaluation of the students, which included three partial exams, besides the final examinations for each subject.

However, in the following year, the application of this system would be suspended due to the process known as Revolution of 1930, which ended with the deposition of president Washington Luís in 24th of October. In the same day, the Interior and Exterior secretary, Oswaldo Aranha, in the exercise of the state government as a substitute of the governor Getúlio Vargas, by the decree n. 4.621, ended the classes in 31st of October and excused from the final examinations all the students who had received an average grade of five in the partial exams.

The same measure would be repeated in 1935, due to the commemoration of the centenarian of the Farroupilha Revolution (decree n. 6.048/1935), and again in 1936 (decree n. 6.320/1936), suggesting that there was a major pressure, on the part of the students, for the lowering of the academic requirements, but, also that the relaxation of the rules, in a similar way to the transferring of teachers to bigger cities, or the assignment of direction and inspection positions, was a current exchange used by the state government to extend its base of support.

Ultimately, the rarefied documentation produced in the period of the First Republic and the limitations of the inventory of sources established until the moment, in the scope of the research project, does not authorize any conclusive statements on the Arithmetic taught in the state's primary schools. However, there are several indications that the programs, as well as the set of norms, expressed more the will of the governments to control and to establish a modernizing trend to the primary education than an ordering ruling of the teaching practiced.

Primary education in the state in the Era Vargas

The 1930s were characterized by the succession of state governments identified with Getúlio Vargas politics. Flores da Cunha, administrator appointed by Vargas in 1930, served a term as an elected governor from 1935 to 1937. Having broken off with the federal government, and in the context of instauration of the Estado Novo, he had his term interrupted and was succeeded, after a brief interval, by the administrator Cordeiro de Farias (1938-1943).

During the Vargas government (1928-1930) and the first term of Flores da Cunha (1930-1935) there was a major expansion of the public school network and, specially, of the serial teaching. Along these seven years, seven colégios elementares and 71 grupos escolares were created, totalizing 53 colégios elementares and 104 grupos escolares.

But it was in the second term of Flores da Cunha, as the elected governor, that a reordering and modernization endeavor of the school apparatus was initiated, being continued and deepened in the government of the administrator Cordeiro de Farias.

In 1935 the decree n. 5.969 created the State Secretariat of the Education and Public Health Issues and the decree n. 6.105 created the State Council of Education. In 1938, by the decree n. 7.641, regional Education Sections were created, linked to the ten school regions in which the state was divided.

In 1938, by the decree n. 7.640, the career of the state primary public teaching was organized and enacted. By its means, according to Bica and Corsetti (2012), "the reorganization of the teachers' professionalization, the standardization of pedagogical questions, besides the promotion of educational changes in the state of Rio Grande do Sul was searched for" (p. 251). The decree established a ruling and annual calendar of selections, linked to the functioning of the Teachers School and complementary schools; it detailed criteria and procedures for transference of the teachers from the most-distant localities to the cities, as well as criteria and procedures for the assignment of the school principals and other positions. It stated, at last, the whole standardization presumably based on the criterion of the neutrality, moving away the interferences and persecutions according to political party interests or affinities: "Yesterday, fights of petty competitions,

moral dependence, unjust precluding. Today, honest effort of professional competition, autonomous victory, recognition of the true merit." (Gayer, 1939, p. 26)

A new Internal Statute of the Primary Schools was established by the decree n. 7.929 of 1939. The primary schools were grouped in two types: isolated schools and *grupos escolares*. In this year, the state already had 351 *grupos*, twice as much the number of *grupos* and *colégios elementares* in 1935, and 797 isolated schools (Gayer, 1939).

The levels of the primary education were redefined and called as grades, extending from the first to the sixth grade[3]. The decree established minimum requirements of attendance and criteria of promotion of the students to the following year. It detailed calendars, time schedule, and practices, like the entrance of the students in the building "followed by the teacher and to the sound of a song or marching" (art. 11).

The Statute established, also, general conditions of functioning of the schools. They should be equipped with libraries, should have a set of substitute teachers, in a number proportional to the amount of effective teachers. On the other hand, the Statute authorized the functioning of the school in reduced turns of three hours, "when the high school registration and the lack of enough space in the building make it necessary the use of three turns within the school day" (art. 9).

All this new institutional framework aimed at, according to Peres (2000), not only the ordered expansion of the network and the "control of the course of the works in the educational establishments", but the implementation of "a scientific pedagogical orientation" (p. 129).

Arithmetic in the new programs of teaching

The decree n. 8.020 of 1939 established a new minimum program to be adopted in the schools. It is important to observe that, in accordance with the adopted scientificist vision, the program was declared experimental and

> subject to periodic revisions, in order to receive the amendments determined by the results of research, inquiries, and observations referring to the requirements of the environment and to the interests and real possibilities of learning of our school children. (Decree n. 8.020, art. 2).

Even though experimental, it was detailed, containing general goals of the subject, specific goals, the essential minimum, and the normative of each subject, for each one of the six grades of primary education. Mathematics appeared as a subject, encompassing Arithmetic and Geometry.

The program of 1939 was as long as the one of 1899. At the end of six grades, the students were expected to operate with decimal and proper fractions, percentages, square and cubic roots, decimal metric system units of measure and older ones, to evaluate the area and the perimeter of the circle and regular polygons of up to eight sides.

The effort to, at the same time, guide and control the action of the teachers is evidenced in the detailing with which the "essential minimum" for each year was described, in which the difficulties, the deepening or magnification should be gradually introduced. For

[3] The decree n. 491 of 23 of February of 1942 extinguished the sixth grade of primary education in the state.

example, in the first year, among several items, there was the “notion of half” (decree n. 8.020, p. 72), in the second year the notion of “halves, thirds, quarters, etc.” (p. 85), and in the third year the “notion of fraction as part of the whole.” (p. 95). In the second year, there was the item “Divisions with simple divisor and dividend up to 100” (p. 85); in the third year, the “Division of any numbers” (p. 95).

The call to the concrete and to the intuition reappeared in the declared objective to provide to the child, “in direct and personal action on the things, the concrete and experienced material that will serve as a basis for the mathematical abstractions” (decree n. 8.020, p. 71). This call, however, was immersed in a wider set of enunciates that disclose the influence of the emergent Educational Psychology and the *Escola Nova*, which spread out in Brazil, mainly, since the 1920s (Peres, 2000).

The teaching of Mathematics, in this new discourse, aimed at the “acquisition of concepts,” the “correct establishment of numerical relations” (decree n. 8.020 p. 72), the “safe knowledge of fundamental arithmetical coordination” (p. 73). The action of the teacher should be based on the understanding of the child’s thinking, when assuming as a reference “the knowledge of mathematical order that the child possesses when entering to the school” (p. 71) and “to discover the difficulties not yet dominated by the student” (p. 73).

The abstraction should be constructed from the manipulation of objects, such as the “concrete counting" (decree n. 8.020, p. 85), by means of theatre plays and the references to the experiences lived by the children. The “real problems from the children’s life” should be valued (p. 73), such as those of “expenses, snack, transportation, school supplies, etc.” (p. 85), “being it convenient to lead the students to identify themselves with the characters of the problem” (p. 96). The concrete and the experienced situations, however, should not be only starting points for the learning, considering that it is the reality that “provided meaning” to the concepts (p. 85). Activities of “recognition of currency” and “money change practice,” simulating extra-school practices, were at the same time didactic resources and expressions of the “utilitarian” character (p. 72, 85) assigned to the teaching of Mathematics.

The activities should be able “to cause a vitalized effort in the students” (decree n. 8.020, p. 96), and with this purpose the resource to arithmetical games, to the theatre plays of purchase and selling, to the school supply fair or bazar, to the projects, excursions and visits, to the “problems formulated by the students themselves” (p. 85) e to the “price tables organized or collected by the students” were proposed (p. 85).

This repertoire of didactic guidance did not aim at the motivation of the students only: it was expected that the “knowledge of the concepts” would be followed by the “automatizing” of the calculation procedures (decree n. 8.020, p. 85). In 1942, an article published in the Revista de Ensino, of wide circulation, warned to the risks of the “methodological extremism” (Souza, apud Bastos, 2005, p. 150):

> With the school renovation movement having condemned the purely passive memorization of the contents, we have fallen on the opposing end, and the systematic training of the math operations chart was almost completely abandoned. A scary decrease of the efficiency of the calculation resulted from this. (A. Souza, apud Bastos, 2005, p. 150)

The study of the psychology of the child and the resource to the active methods aimed at, above all, to an efficient teaching.

An education guided towards the exams

In the search for efficiency and control on the school activities, an increasingly specialized apparatus was established. In 1942, the Secretariat of Education and Culture was created and, within it, the Department of Teachers' and Primary Education.

In 1943, under the influence of the recent National Institute of Pedagogical Studies - Inep - the Center of Educational Research and Orientation - CPOE -, was created from the transformation of the Technical Section of the former General Board of Public Instruction. According to Quadros (2006), the technicians of the CPOE were concerned with the development of research on teaching-learning and with the

> professional development of the teachers, which involved the planning, the coordination, and the evaluation of the teacher's work, aiming at reaching the production of a disciplined work force mobilized to accomplish the educational renovation, in the direction of the implantation of the *escolanovistas* principles. (p. 126)

Among the mechanisms used in the supervision and guidance to the school tasks, it can be mentioned: the institution, already in 1940, of the Studies Circles, gathering principals or advisers of the schools for management or pedagogical discussions; the demand of the presentation, on the part of the schools, of planning and reports; the offer of courses, seminaries, or study sessions for the teachers (Quadros, 2006).

The external control on the school activity was, probably, exerted with higher efficacy by the objective exams, elaborated by the CPOE from 1943 to 1965 and applied in all the schools at the end of each school year, as final examinations that measured the knowledge of the students and decided on their promotion to the following year. The declared statements were "to guarantee equitable treatment of the students, demanding from all of them the same minimum standards of knowledge" and "to make the results of the different classes comparable" (Peres, 2000, p. 260).

The application of these exams, produced externally to the schools, resulted in high indices of failure, especially in the first primary year: in 1950, only 54% of the students of the first year passed the exams (Moreira, 1955).

When visiting the state in the 1950s, for a study commissioned by Inep, Roberto Moreira (1955), based on interviews and observations of classrooms, noticed that the objective exams widely determined the action of the teachers. Urged, on one hand, to the adoption of active methods, and, on the other one, pressured by the tests, which also evaluated the efficiency of their teaching practice, the teachers guided the teaching, above all, for the approval of the students in the exams:

> This process of using two methodologies, one much more active, requiring extra classroom activities, and another one much more formalist and automatizing, was found by us in eight *grupos escolares* we visited. It was impossible to verify to what extent both had any correlation among each other. What is clear to us is that the teachers, willing to apply good teaching methods, felt urged to rehearse them, once in a while, almost for the purpose of recreation, yet focused on obtaining the mental memorizations

> and mechanisms that would be tested in the exams. This second aspect was, undoubtfully, the most important for the teacher. (Moreira, 1955, p. 131)

Moreira (1955) reports the common practice of the teachers to dedicate themselves in the last two months of the year to the students who would have a chance of success in the exams. Not all the students used to take the final exams: from this appeared the figure of the disabled student, failed in advance, due to a performance considered too poor. The distribution of the students in groups of strong and weak became naturalized: "We even noticed certain fatalism on the part of the teachers. The one who was responsible for a weak first grade was satisfied beforehand with the possibility of a great percentage of failures" (p. 137).

The focus in the tests is one of the explanations for the emphasis on the automatizing of the calculations that is transparent in the statements collected by Peres (2000):

> *They learned everything about Mathematics. But the math operations chart was always on the tip of their tongue. It had to be! […] We used to play a game. Three times four, plus five, minus two, times eight and so on. […] In order to see who would win. That was an awful thing! They liked it. Seven times eight? One cried out: fifty-six. Minus two, plus four, times five, divided by three. It means that it was an exercise as well, isn't it? It was very good!* (D. Maria de Lourdes, *apud* Peres, 2000, p. 381).

> *The principal did not want already in those times. She didn't want, for example, that they knew the math operations chart by heart. Thus, she thought that in class we could make exercises, singing with them, speaking aloud, they would know by heart, isn't it?* (D. Sueli, *apud* Peres, 2000, p. 381).

The pedagogy that appears as predominant, in these statements, was the one of the fixation exercises: "*If it were Mathematics, I used to teach a problem, counting, expressions, equations, more advanced already, isn't it? Change of signals, that kind of think. They got it, they usually got it […]. I used to make a lot of exercises"* (D. Sueli, apud Peres, 2000, p. 377).

A sort of mathematical education was established that, incorporating elements of theatre plays, music, and games aimed the memorization of the math operations chart, the fixation exercises, the ability in the calculation and the manipulation of numerical expressions. A sort of teaching that, above all, aimed to the exams.

Final remarks

In the years that preceded the decree of the Organic Law on Primary Education, which standardized the primary education in a national scope, Rio Grande do Sul consolidated its network and an apparatus of control, supervision, and technical advice to teaching.

The graded teaching was established as a standard of primary education and, with it, the logic of the selection of students by means of promotion or retention was installed and became naturalized.

The teaching programs recommended the active methods, the focus on the knowledge and interests of the students, while the tests, according to the interpretation of the teachers, required the dexterity in the calculation and the handling of the Mathematical writing.

The schooling was extended until the five grades, but not for everybody. Only the good students reached the end of the primary education, which assumed, gradually, a new function: to prepare the students for the competitive exam of admission to the secondary school, when the mathematics test played a major selective role.

The objective tests had a place of prominence in the new configuration of primary education. On the one hand, they were an instrument of prescription of the teaching, more eloquent than the programs. On the other, they naturalized the selection, making the students responsible for their success or failure. The school trajectories of the students were, since early, defined according to their learning of Arithmetic, reading, and writing. According to the official discourse, mathematics was to be learned for the daily life; in practice, mathematics should be learned so that children could outlive school.

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