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## A Look at the National Pact for Literacy at the Right Age in the Mathematics Education Context

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**Abstract:** This article aims to present a public policy of large-scale literacy teachers continued training, the *Pacto Nacional pela Alfabetização na Idade Certa (PNAIC)*, making a summary of the Brazilian dissertations and theses results which approached this public policy in the context of Mathematical Education. Initiated in 2012, the *PNAIC* involved more than three hundred thousand literacy teachers, from more than five thousand cities for five years. This article uses a qualitative research approach, in the descriptive modality, showing a status of the art of these researches. The set of works analyzed was divided into three groups, according to their declared research objectives: Objective 1: To analyze-investigate the meanings brought by the literacy teachers about the *PNAIC* (75.5%); Objective 2: To analyze-investigate the meanings brought by the other participants about the *PNAIC* (7.5%); and Objective 3: Unveil the *PNAIC* (17%). The analysis of the researches results associated with these objectives allowed us to reach four conclusions: 1) The trainings promoted by *PNAIC* supported changes in the pedagogical practices of the literacy teachers; 2) the trainings promoted by *PNAIC* were necessary, but they were not enough to combat illiteracy; 3) the trainings promoted by the *PNAIC* induced the literacy teachers to reflections about the pedagogical practices and 4) the trainings promoted by the *PNAIC* showed weaknesses. In summary, this article presents an initial analysis of the scope from the manifested studies in dissertations and theses and supports the realization of new studies in order to deepen the analysis and evaluation of the varied aspects of one of the broadest training programs ever implemented in Brazil.

**Keywords:** Teachers training. Mathematical Literacy. Training of teachers who teaches mathematics. *PNAIC*. Policies cycle.

## Introduction

This article refers to a past time that can cause nostalgic feelings, since it was produced concomitantly with the anguish and uncertainty situation due to the Covid-19 pandemic. It is always possible to extract positive meanings from the already done practices, either on the importance of science and knowledge, or on the engagement of people who are bravely on the front line today, fighting against the pandemic, taking care of us, many times before taking care of themselves. We

must also reflect on the engagement of people who works with education, such as professionals from Elementary School who worked in the *Pacto Nacional pela Alfabetização na Idade Certa (PNAIC)*<sup>1</sup>.

It is necessary to explain, right from the beginning, that *Right Age* is related to the period of starting and staying at school. In Brazil, it is still common for students to miss years of study or stop attending schools. The public policy promoted by the *PNAIC*, therefore, had as its axis the entry and permanence of children in schools, without abandoning their studies and without failing in the initial grades, expecting the admission at the age of six and the full literacy at the age of eight, so the expression *Right Age*.

The *PNAIC* started in 2012, but there is a large context of public policies to be considered. Eight years earlier, in 2004, the *Rede Nacional de Formação de Professores (RENAFOR)*<sup>2</sup> was created, which organized reference centers on teachers training, bringing together 18 Higher Education Institutions (HEIs) all around Brazil. From this network, several policies were implemented. The history of the *PNAIC* constitution is narrated in several studies (Alflen, 2017; Melo, 2015; Boeing, 2016; and Silva, 2017) and is not the subject of this article. Formally, the *PNAIC* was defined by the Ordinance No. 867, from 2012, as a formal commitment assumed by the federal, Federal District, states and municipalities governments to ensure that all children were literate by the age of eight, at the end of the 3rd grade of elementary school.

In this article, the *PNAIC* will be described based on the notion of *Educational Public Policy Cycles*, focusing on three contexts: the context of influence, the context of policy text production and the context of practice. The next section describes the meaning of each of these terms and their place in this article. The article is organized into four sections: in the first, The Cycles of Educational Public Policies, it is made the description of the analysis tool used, exemplifying it with the *PNAIC* definitions and objectives; the second section describes in details the Training Notebooks used in the context of practice that was the object of analysis in the dissertations and theses; the third section describes how the Brazilian researches on *PNAIC* with a focus on mathematical literacy were approached and organized, and finally, the fourth section shows a way of looking at the *PNAIC* from the results of this analysis, proposing new researches and points of view.

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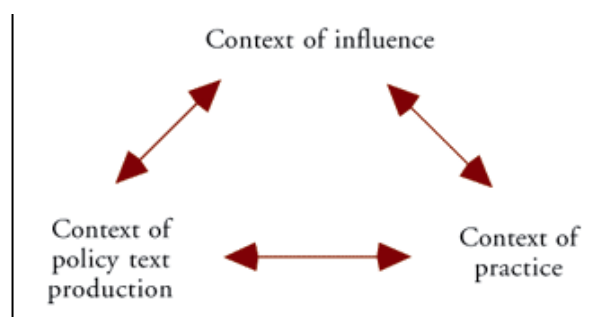
<sup>1</sup> National Pact for Literacy at the Right Age (NPLRA)

<sup>2</sup> National Teacher Training Network.

## The Educational Public Policies Cycles

The *Educational Public Policies Cycles* have been used in Brazil as an analytical and critical method of educational policies. Mainardes and Stremel (2015) presented a survey of 145 papers which used the Policies Cycle approach while Lima, Souza and Luce (2018) analyzed 78 theses and 92 dissertations. In English, it's possible to have an idea of the policies cycle implications in the study of educational public policies with Lingard and Sellar (2013).

Ball, Bowe & Gold (1992) indicate that the approach was composed of three parts: the proposed policy, the policy in fact and the usage policy, seeking to show, respectively, the government intentions, educational departments, schools and local authorities; the texts that formalize it and; finally, its implementation process. Considering that the formulation and implementation steps could not be separated, the authors considered that public policies should be understood through the *contexts*: the context of influence, the context of policy text production and the context of practice. Such contexts have interrelations and must be thought as a dynamic and continuous process. The figure 1 shows how the authors highlighted these interrelations.



**Figure 1:** Approach by the public policies cycles. Ball, Bowe and Gold (1992, p. 20)

Despite of having interrelations and influencing each other, they have their own particularities and places over which different actors have greater or lesser influence. In his more recent studies, Ball develops the policy enactment, understood as the ways in which actors interpret,

adapt and/or transform the policies. Following, each of the contexts will be highlighted and articulated to the *PNAIC*.

The context of influence is the starting point from which the speeches are initiated and the policies begin to be constructed. The interest groups and the dispute for the role of influencing the definition of the policy purposes to be developed are present in it. Political parties, the media, trade unions and other society organized segments are present and decisively interfere, formally and even informally. Even international interests are part of this context, which can be highlighted through projects that require financing through banks and correspondent counterpart requirements. The *PNAIC* is institutionalized as a continuity of previous programs and its origin was in a government led by the Workers' Party, elected for the third consecutive time and with great popular support at that time. The data Census from 2010 were decisive for the definition of this educational policy: at the time, the 15.2% illiteracy rate at the age of eight was widely used to justify the need for an action focusing on the literacy of children starting from 6 years old. This rate varies according to the urban or rural region, or according to the country geographic regions, with the Paraná State having the lowest rate in the urban region: 4.7%; and Amazonas with the highest rate in the rural region: 48.6%.

Results of large-scale evaluations were added to the Census data showing that the number of children up to 8 years old who had reached the expected knowledge in writing, reading and mathematics was below 60%, on average, in Brazil. Based on this set of data the need for investments in this schooling range was defined. From this diagnosis, *PNAIC* can be considered as a parameterized answer for three factors: 1) the political decision and the financial possibilities; 2) the accumulated expertise by the existence of a *Rede Nacional de Formação de Professores* (RENAFOR), created in 2004, and the correspondent successful experience of the large-scale teachers training programs; and 3) the social demands based on data that demonstrated the need for investment in the literacy cycle.

Returning to the *Policies Cycle* description, the second axis deals with the the context of policy text production. Having the *PNAIC* been created and executed with the broad participation of Brazilian public universities, at least one per State of the Federation, it was translated in terms of a national proposal. "The context of policy text production is the space in which policies are translated into discourses and, generally,

they are better articulated with 'the language of public interest in general'" (Ball, Bowe & Gold, 1992, p. 20). The ordinance No. 867, already mentioned, highlights the main *PNAIC* objectives:

- I – to ensure that all students from the public education systems are literate, in Portuguese and Mathematics, by the end of the 3rd grade of elementary school;
- II – to reduce the age-grade distortion in the Basic Education;
- III - to improve the Basic Education Development Index (**IDEB**);
- IV - to contribute to the improvement of the literacy teachers training;
- V – to build proposals to the learning rights and children's development definition in the first three years of elementary school.

These objectives were implemented with actions in four axes that will be highlighted below.

**I. Literacy Teachers Continued Training:** 2 years classroom course for literacy teachers, with 120 hours per year workload, based on the Pro-Literacy program, whose methodology proposes studies and practical activities. The meetings with the literacy teachers will be conducted by study advisors. The study advisors are network teachers, who will take a 200 annual hours of duration specific course, taught by public universities. It is recommended the study advisors to be selected from the team of tutors trained by the Pro-Literacy in the county or state.

It was, therefore, a long-term course, in line with the recommended by several researches in the teachers training scope. In addition, the course took place in the teachers county of origin and, then, it should be based on local realities. It is noteworthy that emphasizing the need for the choice of the study advisers from the team of tutors trained by the Pro-Literacy it points to the intention of promoting the municipalities autonomy in managing their trainings, investing in the training of a local professional who should, over time, become a reference for teachers training in that County.

**II. Didactic and Pedagogical Materials:** This axis is formed by sets of specific materials for literacy, such as: didactic books (delivered by **PNLD – National Program of Didactic Books**) and respective teacher manuals; pedagogical works complementary to didactic books and collections of Portuguese dictionaries (also distributed by PNLD); pedagogical games to support literacy; reference, literature and research works (delivered by **PNBE - School Library National Program**); pedagogical support works for teachers; and educational technologies to literacy support. Besides the new content for literacy, the amount of materials delivered to schools also changes, whose collections will be calculated by the number of literacy classes and not by school, making possible for teachers and students to better explore the contents.

The *PNAIC* stood out for highlighting and moving a wide collection of materials already existing and defined by other educational policies. This material was often unknown and, sometimes, it was abandoned in infrequent school facilities. Based on these findings, the *PNAIC* provided changes in the distribution logic and motivated the expansion of the materials collection, notably those of children's literature. In addition, specific *Training Notebooks* were prepared together with the **IES (Higher Education Institutions)** for each year of the formation of the Program, and this gave to the course not only a parameter of quality but also some degree of uniformity in its fundamentals, even in a country of continental dimensions.

**III. Assessments:** This axis brings together three main components: procedural assessment, discussed during the training course, which can be developed and carried out continuously by the teacher with the students. The second change refers to the availability of a computerized system in which the teachers must insert the results of *Provinha Brazil* for each child, at the beginning and at the end of the 2nd grade, and it will allow teachers and managers to analyze this information in aggregate and to decide for any adjustments. The third step is the application, to the 3rd grade graduating students, of a universal external evaluation, by **INEP (National Institute of Educational Studies and Researches)**, aiming to assess the literacy level reached by them at the end of the cycle, which will enable the school networks to implement corrective actions and policies. Also, in this case, the cost of systems and external evaluations will be defrayed by the Ministry of Education. In 2013, the Ministry of Education will publish a notice informing the award and recognition criteria to teachers, schools and education networks that most advance in the literacy of their children, considering the results measured in the evaluations.

The *PNAIC* was extended beyond the time of its initial proposal and this was made possible, among other reasons, because of its detailed and continuous evaluation process to which each of its actions was submitted. During the training meetings, the experiences reports carried out by the literacy teachers with their students, the discussion of these reports and its incorporation in the notebooks that would be created in the subsequent years functioned as an effective return for the teachers' action and reflection about their own practices. Although it was mentioned the intention to carry out awards, this never happened because the parameters by which this could be done while maintaining the principles of justice have not been defined.

**IV. Management, Social Control and Mobilization:** The institutional arrangement proposed to manage the Pact consists of four instances: i) a National **Management Committee**; ii) an institutional coordination in each state, composed by several entities, with strategic and mobilization tasks around the Pact objectives;

iii) State Coordination, responsible for implementing and monitoring actions in its network and for supporting implementation in the municipalities; and iv) Municipal Coordination, responsible for implementing and monitoring actions in its network. Also in this axis, the importance of the monitoring system that will be provided by **MEC (Ministry of Education)** stands out, which aimed to support the networks and ensure the implementation of different stages of the Pact. Finally, MEC's emphasis on strengthening educational councils, school councils and other departments committed to quality education in states and municipalities is also highlighted.

This axis sought to establish a management form that would make it possible to reduce problems found in the implementation of other public policies. Brazil is a federative system in which the Federation Units are autonomous, being the Municipalities autonomous in relation to the State and these autonomous in relation to the Federation. The *PNAIC* was instituted in each county upon an accession protocol, because even if the governors of the neighbor cities were from the same political party, frequently the policy actions, mainly educational, were not - and never were - uniform. Each County had the possibility to adhere or not to the *PNAIC*, and, even adhering to, its autonomy defined the possibility of, for example, computing the hours of the course as hours of the teacher's work or as hours spent outside his/her working hours.

Beyond the Laws, another text produced and which mobilized the *PNAIC*'s training actions were the *Training Notebooks*. Such materials were written in 2012 by experts in the literacy area; in 2014 by experts in the mathematical literacy area; and in 2015 by a group of experts in both areas plus the contributions from researchers of arts, sciences, history and geography areas. In this article we will present, in the next section, only the notebooks dealing with mathematics education. Then, to conclude the presentation of the Policy Cycle, we will deal with the third context.

According to Ball, Bowe & Gold (1992, p. 21), the context of practice, “the arena of practice to which policy refers, to which it is addressed”. The policy “is not simply received and implemented within this arena rather it is subject to interpretation and then ‘recreated’”. In the scope of the context of practice, we consider the *policy enactment*. It is about how a public policy is implemented and reframed by the actors. In our case, in addition to the legal indications and the intentionality of the



training materials authors, the policy was put into practice by Universities, States, Counties, Schools and teachers in different ways.

According to the official documents, the *PNAIC* was structured as a multiplicative principle drawing, with a trainer (selected by the **IES - Higher Education Institution**) working with up to 25 study advisers (selected by the Counties) who, in turn, worked with 25 literacy teachers (target audience of the project) that were working in the literacy classroom at that time. It is, therefore, a network model that has as one of its main advantages to reach, in person, a large number of people.

The Counties did not always have a professional with the adequate training to act as a study advisor and this influenced in the quality of the public policy implementation. Moreover, Brazil has a heterogeneous demographic density, a wide cultural diversity, different colonization histories and great difficulty in mobility and access in some locations, to name just a few of the aspects that influence the implementation of a policy like that. To analyze the context of Brazilian practice is impossible because there are no parameters that ensure adequate data treatment for so much dissimilarity, but there are viable approaches possibilities, since they do not intend to be exhaustive, and one of them is to look at the theses and dissertations produced with the *PNAIC* actors, and this is the object of this article. Before that, another delimitation is necessary, our focus is restricted to the part of the *PNAIC* which is presented in the works that observe the formation in *Mathematical Literacy* in the **Literacy Perspective**, that happened, having as reference the *Training Notebooks* described in the next section.

## Mathematics Education Training Notebooks

The training materials in the area of Mathematical Education were called Mathematical Literacy Notebooks in the Literacy Perspective. It is understood that:

(...) the comprehension of the texts we read and the efficiency of the texts we write also depend on the knowledge we are developing about the processes, resources, representations and criteria adopted to quantify and operate with quantities, to measure and order, to orient yourself in the space and organize it, to appreciate, to classify, to match and use the forms. This process occurs because the texts reflect the way those who write them relate to the world, a way decisively marked by these processes, resources, representations and criteria that are related to what we call "Mathematics". (FONSECA, 2015, p. 29)

So, mathematical literacy would only make sense in the context of children's literacy. Within this premise, eight training books were created, with the titles: Organization of Pedagogical Work; Quantification, Registrations and Clusters; Construction of the Decimal Numbering System; Math Operations in problems solving; Geometry; Quantities and Measures; Statistical Education; Mathematical Knowledge and other Knowledge Areas.

In addition to these eight notebooks, the training material contained a "Presentation" notebook, two reference notebooks ("Inclusive Education" and "Countryside Mathematical Education"), as well as a notebook and booklets about games entitled "Games in Mathematical Literacy".

Such material, as we will explain later, should be worked on by the study advisers who were selected by the participating counties. Not all the study advisers had the specific education in the mathematical área, but they should be considered as teachers trainers in training. All notebooks were organized by the sections: "Starting the Conversation", "Going deep into the Subject", "Sharing", "To Know More", "Suggested Activities for Group Meetings", "Activities for Home and School".

The section "Starting the Conversation" presented the objectives of the notebook. The section "Going deep into the Subject" presented a set of texts causing reflections about the notebook subject. The "Sharing" section presented activities suggestions for the training meetings. The section "To Know More" indicated books, articles and videos commented on for the teacher. The section "Suggested Activities for Group Meetings" oriented work possibilities while the section "Activities for Home and School" problematized the classroom reality and presented activities that the literacy teacher should do with his/her students in his/her classroom.

It is importante to say that during the training courses before the training in Mathematical Literacy, teachers from all over Brazil were invited to write reports about their practices, reports that would be evaluated by the Trainers and Editors for later inclusion in the Training Notebooks. In its final edition, each notebook included at least six reports with experiences carried out in the classroom during the previous year training, and these reports were then discussed by specialists of

the Mathematics Education area and they favored the identification of teachers in the training process with the material that was used and that contained contributions from their own experiences.

In the five years of the *PNAIC's* existence, a large amount of written material has been produced, this short description is only intended to help us to establish a background that allows to situate the policy as it was conceived and written. In the next section, an analysis based on theses and dissertations is developed, about how it happened in the context of practice.

## The PNAIC and the researches

A consultation at the *CAPES Theses and Dissertation List* provides an initial list of 384 papers associated to the word *PNAIC*, which is specific, unambiguously, to this public policy. A second approach takes to a list of 84 papers for the words' "*PNAIC AND MATHEMATICS*" search, which are listed in this article's attachment. After a fluctuating reading of these works abstracts, it was possible to promote a refinement of the analysis *corpus* for this research focus: the *PNAIC* and the teachers who participated of the *PNAIC* as the researches protagonists. This filtration resulted in 41 works that were analyzed for this article.

These 41 works were examined based on the following elements: Higher Education Institution [public or private], Federative Unit, Region, type of work [Masters degree (academic or professional) or Doctors degree], question / objective, instrument for collecting data / analysis tool, data source and results / conclusion.

The first quantitative summaries show the following profile of the works: (1) From the Higher Education Institutions (IES) point of view, 86% of the works were developed in public institutions, 9.5% in private institutions and 4.5% in public-private institutions; (2) The distribution by regions in the country is shown in Table 1, just below; and (3) the type of work represented a total of 84% of academic Master's dissertations, 11.5% of professional Master's dissertations and only 4.5% in Doctoral degree theses.

Region	%
Midwest	16,5
Northeast	4,5

North	4,5
Southeast	33,5
South	41,0

**Table 1:** Works' distribution by region

In a descriptive summary, we highlighted the percentage of researches produced in Public Institutions (86%), in the South (41%) and Southeast (32.5%) regions, with the predominance of researches linked to academic Masters degrees (84%).

If we compare the results from the Region with the Census data on illiteracy, we realize that the regions with the lowest illiteracy rates produced more researches, while we did not find any research produced about the *PNAIC* in two of the States with the highest illiteracy rate. It is a fact that other actions and, possibly, other researches were produced, but not directly involving the Mathematics *PNAIC*. The researches, in general, allows a more critical look at the training policies and the researches absence, as we evidenced, indicates the need to obtain and deepen more information about the possible reasons for this impossibility or lack of interest in carrying them out.

In turn, the methodological treatment adopted in the investigations was summarized in two tables: 2 (Data Collection Instruments) and 3 (Analysis Tools).

<b>Data Collection Instrument</b>	Questionnaire	Interview	Observation	Oral History	Experience Report	Field Diary	Others
	27%	37%	18,7%	3%	6%	4,3%	4,0%

**Table 2 -** Data Collection Instruments

<b>Analysis Tool</b>	Content Analysis	Discourse Analysis	Fenomenologia	Cultural Historical Psychology	Other Instruments	Not explained
	23,5%	9,5%	5%	5%	12%	45%

**Table 3 -** Analysis Tools

In a descriptive summary of Tables 2 and 3, we highlighted the data collection instruments interviews (37%) and questionnaires (27%); and in relation to the analysis tools, we pointed the percentages of “content analysis” (23,5%) and “discourse analysis” (9.5%).

Table 4 presents quantitatively the data sources for all the 84 researches.

Data source	%
Literacy Teachers	69%
Literacy Teachers, Trainers and Study Advisors	2,4%
Literacy Teachers, Trainers, Coordinators and Supervisors	2,4%
Literacy Teachers and Study Advisors	7%
Literacy Teachers, Study Advisors and Coordinators	2,4%
Literacy Teachers and School managers	2,4%
Study Advisors and Coordinators	2,4%
Coordinators	2,4%
Literacy Teachers, Study Advisors, Coordinators, Supervisors and <i>PNAIC</i> Notebooks	2,4%
Literacy Teachers and Coordinators	2,4%
Trainers, Coordinator and Municipal Secretary	2,4%
Researchers	2,4%

**Table 4:** Data source

Table 4 shows us that the main people participating in the researches were literacy teachers (69%). There are few studies that favored to analyze the point of view of other people involved in the organization of the *PNAIC* formation, beyond the literacy teachers (21.4%). In only 9.6% of the examined researches, literacy teachers did not participate.

The examination carried out points to the absence of researches that privileges the majority of those involved in organizing the *PNAIC* formation in line with the *PNAIC* Notebooks. These researches would make it possible to explain the different points of view of those who worked at the *PNAIC* and, in some way, they would assist in proposing new educational public policies.

Regarding the researches objective, the reading of the works' abstracts allowed them to be organized in three large groups, those who intended:

- 1) To analyze-investigate the meanings moved by the literacy teachers regarding to the *PNAIC* (75.5%);
- 2) To analyze-investigate the meanings moved by the other participants regarding to the *PNAIC* (7.5%); and
- 3) To unveil the *PNAIC* (17%).

Each objective is composed by the summary of several objectives that are present in the analyzed works and that are organized here in alphabetical order.

**Objective 1:** To analyze-investigate the meanings moved by the literacy teachers regarding to the *PNAIC*

To analyze the influence of *PNAIC* on the qualitative aspect of the practices in the classroom.

To analyze the pedagogical practice of literacy teachers based on the *PNAIC* formation.

To analyze the implications of continuing training in the pedagogical work of two teachers who teach mathematics, having as reference the in-service training offered by the mathematics *PNAIC* 2014 in the Federal District.

To analyze the opinions of different actors involved with the *PNAIC* about the ways taken by the Program and the results and effects of the teacher training.

To analyze the repercussions of the *PNAIC* formative movement on pedagogical practice in Mathematics Education, in the public policies for continuing literacy teachers training context.

To analyze what are the contributions of the *PNAIC* mathematics continuing training to the pedagogical practice of the literacy teachers from Ponta Grossa city.

To evaluate the contributions to the teaching and learning process.

To assess the *PNAIC* contributions/challenges.

To understand the continuing training in the *PNAIC* scope and its contribution to the improvement of literacy practice in the literacy cycle (1st to 3rd grade) in the Mathematics subject scope.

To understand the teachers practice from this training, as well as investigate if this training helped in the teaching knowledge mobilization and in the construction of practices aimed at improving the teaching and learning process of students in these grades.

To understand the meaning effects related to the mathematics teaching in the early years of Elementary School, produced in the discourse of literacy subjects-teachers (SPA) participating in the *PNAIC* continuing training, in 2014, in the city of Feliz Natal / MT.

To understand the *PNAIC* impacts on the mathematical formation of literacy teachers and its relation to the performativity culture.

To constitute oral sources based on interviews with literacy teachers who participated in the *PNAIC* -2014.

To understand how the relationship between the continuing training of literacy teachers through the *PNAIC* and their pedagogical practices in Mathematics happened.

To identify the contributions of the *PNAIC* continuing training to the pedagogical practice in the mathematical literacy of the 1st to the 3rd grade teachers from the municipal education system in São Mateus / ES.

To identify the perceptions of four literacy teachers, from their own perspective, regarding the continuing training received; to identify and analyze pedagogical practices for the mathematical literacy under the literacy perspective; and, to identify the marks of this formation in relation to the geometry teaching and learning, as a result of the *PNAIC*, in 2014.

To identify how a group of multipurpose teachers perceive the *PNAIC* contributions in their teaching practices and knowledge, regarding to the mathematics teaching in the early years, whose central theme was mathematical literacy.

To identify and analyze teachers' perceptions about the implications of the *PNAIC* - Mathematics formation in their classroom practices.

To identify the meanings attributed to the teaching of Mathematics in the speech of the teachers who participated of the program in 2014.

To investigate "what the teachers say about the *PNAIC* and the processes of teaching and learning mathematics in the first cycle of the Elementary School (EF)".

To investigate the *PNAIC* contributions to the continuing training of literacy teachers from São Borja city in RS, especially the *PNAIC* -Mathematics of 2014.

To investigate the *PNAIC* implications for the continuing training of literacy teachers from the municipal public school system from Lagoa de Dentro city in PB, in the Mathematics area.

To investigate the *PNAIC* influences in the teaching practice continuity, in the mathematics teaching, of the literacy teachers of the urban municipal schools from Abelardo Luz, who participated in the Program.

To investigate the *PNAIC* influences (Mathematical axis) developed by MEC - Ministry of Education in the construction of the pedagogical practice of a teachers group from the early years of elementary school in the semiarid region of Sergipe.

To investigate the impact of the *PNAIC* Continuing Training on the Praxis of Teachers who teach Mathematics in the early years, at the Municipal School Herculano Borges, located in Barra do Bugres city, in Mato Grosso State.

To investigate what are the aspects of the *PNAIC* -2014 continuing training, recognized and valued by the teachers, which contribute to the pedagogical practices qualification of mathematics literacy teachers.

To investigate what would be the sequence / continuity of the *PNAIC* training for the teachers who work in the subsequent grades, with the 4th and 5th grade classes.

To investigate if the continuing training in mathematics proposed by the *PNAIC* can lead to a new meaning of the practices and knowledges for the performance of a teachers group from Palmas / TO.

To investigate if the *PNAIC* formation contributed to the practice of the teacher who teaches mathematics in the Early Years of the Elementary School.

To realize if there are reverberations of the *PNAIC* orientations in the teachers' practices, after the training is completed.

To verify if the *PNAIC* formation contributed for the teachers to understand how the mathematical concepts are elaborated by the children of the literacy cycle of the Elementary School and in what sense it happened.

**Objective 2:** To analyze-investigate the meanings moved by the other participants regarding to the *PNAIC*

To analyze the challenges of managing the *PAIC*<sup>3</sup> / *PNAIC* teacher training actions from Acopiara city in CE, based on the design proposed by the Program and the perspective of lining up the continuing training actions with the other actions expected in the five structuring axes of the Program.

To understand the imaginary in relation to the continuing training of Mathematics literacy teachers, from the speech of the coordinators from Barra do Bugres city, Mato Grosso (MT).

To know the process of continuing training of the literacy cycle teachers based on the *PNAIC* actions in the counties of Rio Grande do Sul, from the local actions coordinators point of view in these municipalities.

**Objective 3:** To unveil the *PNAIC*

To monitor and evaluate the teachers training proposed by the *PNAIC* in the state of RJ.

To analyze if movements woven into the *PNAIC*'s continuing training dialogued with the mathematical know-how of a literacy teachers group from Serra.

To understand the possible contributions of the literacy teachers continuing training within the *PNAIC* course's scope to effect social quality changes in the mathematics teaching in the literacy cycle.

To understand how the mathematical literacy shows itself in constitution in the formation movement by the early years teacher.

To know the *PNAIC* planning mechanisms and how they were organized and articulated in different spaces, from the National Education Plan to the planning of schools and teachers to literate all children by the end of the 3rd grade of the EF (Elementary School).

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<sup>3</sup> Programa de Alfabetização na Idade Certa (Literacy Program at the Right Age).



To investigate the place of the literacy teachers' experiential knowledges in the proposal and in the practices of continuing training promoted by the *PNAIC*, developed in 2013 and 2014.

To realize how such policies are placed as instruments for the social problems solution, considering education as a social right and the State as responsible for the organization and implementation of policies that ensure this right.

The relation between the percentages for the first objective and the data collection instruments deserves attention. Privileging interviews and questionnaires compared to the observations, the researchers will be closer to the meanings associated to how much the discourse was incorporated into pedagogical practices than the other way around. Combining interview-observation or questionnaire-observation, it would be possible to establish new parameters of analysis.

Before showing the conclusions, a note: the references that appear here are clippings of the works listed in the *appendix*, in the order they were obtained in the *CAPEs (Coordination of Higher Education Personnel Improvement) Thesis and Dissertations List*, so they are indicated with the order number in brackets and the author's last name.

To examine the results associated to the first objective allowed us to draw two conclusions:

**Conclusion 1: The continuing training promoted by the *PNAIC* favored changes in the pedagogical practices of the literacy teachers.** Some examples:

*(...) the PNAIC was an important teaching knowledges mobilization space that reflected in the practices of the researched group (...). ([01] SILVEIRA, 2019)*

*(...) [the PNAIC contributed] positively to the training of teachers who teach mathematics in the early years, favoring changes in pedagogical practices related to mathematical literacy (...). ([06] COSTA, 2016)*

*(...) the PNAIC -2014 continuing training contributed to the literacy teacher to understand the new concepts in relation to the Mathematical Literacy, expanding his/her knowledge, thus having a change in his/her teaching pedagogical practice where he/she incorporated the pedagogical resources presented by the training in his/her daily life, showing the importance of playfulness and significant knowledge in the teaching-learning process (...). ([14] BRAVIN, 2018)*

*At the end of this investigation work, we reiterate the importance of the PNAIC program, in which it was given an opportunity of, during the continuing training, spaces and moments of study, reflections on education. Such space was not common among the education professionals (...). ([23] MACIEL, 2017)*

*Influence of the PNAIC mathematics course in the discourse of the research participants, their speeches show an awareness about the need of organizing the pedagogical work, so that theory and practice do not dissociate, going beyond the interconnection, constituting transformative praxis, (...). ([24] SANTOS, 2017)*

*(...) this Program added several relationships to the pedagogical practice construction of the course teachers, especially with regard to their knowledge and practices related to the mathematics teaching and the work with students in the early years of elementary school.*

*In the way teachers started to transmit mathematical contents, in the mathematical knowledges expansion, in the sensitivity development to recognize that they need to change, in concern with the students performance, in the search for building practice through exchanging ideas with the coworkers, in the safety at working with mathematics, in the warranty of the student's rights to learn through the contents appropriation and different teaching forms or strategies. ([29] ARAGÃO, 2015)*

**Conclusion 2: The trainings promoted by the PNAIC was necessary, but they were not enough to fight against the illiteracy. Some examples:**

*(...) like any public policy, it must ensure that there is necessary support so that the actions are developed properly in schools, with planning, resources and necessary time. ([08] CAMARGO, 2019)*

*(...) the teachers criticize the training development, the short time spent on carrying out the programmed activities and the articulation with the school managers, as well as the delay in accessing the activity notebooks. ([13] CALLEJAS, 2017)*

*It is concluded that the possible transformations in the teachers pedagogical practices do not depend only on the contributions of na offered course, but also on the material and immaterial conditions that are beyond it, in the school context, in the relationship with the education departments and the government, as well as in the personal desire of each professional. ([28] WEBER, 2018)*

*The mathematical training policy of the National Pact for Literacy at the Right Age is related to the performativity culture, having as its main impact the substantial changes in the teaching work and in being a literacy teacher of Mathematics. ([35] FERREIRA, 2016)*

*We conclude, however, that training programs such as the PNAIC still need to consider the social complexity that is related to the different working conditions found by teachers and students in classrooms, such as the economic exclusion, violence, the lack of infrastructure and didactic resources. In addition, the PNAIC should dialogue with other public policies and be articulated with a career plan, in order to better value the teacher professional development. ([37] CARVALHO, 2018)*

*In addition, they also showed gaps that put into question the long-term effectiveness of the proposal, such as weakness in monitoring the planning*

*process, the non-involvement of the school in its **meso** context and the disregard of other variables that directly interfere in the teacher's work. ([55] COSTA, 2017)*

*The PNAIC is a necessary action, but it is not enough for an effective promotion of the education quality, which requires forwarding a series of other actions that go beyond the teachers continuing training. ([60] PUGAS, 2018).*

The examination of the results associated to the second objective allowed the construction of a third conclusion.

**Conclusion 3: The trainings promoted by the PNAIC led to reflections about the pedagogical practices by the literacy teachers.** Some examples:

*The PNAIC represented a space for continuing training, which provided reflections about the pedagogical practices, enabling the literacy teachers to minimize the gaps in relation to the difficulties presented with the Mathematics and its teaching (...). ([36] PIASSON, 2017)*

*(...) Thus, it is possible to declare that, as Educational Public Policy, the PNAIC promoted changes in the early years teachers pedagogical practices from the experimentation of the new, from studies, reflections and shared experiences in continuing training collective spaces. ([48] SALLES, 2016)*

Finally, the examination of the results associated to the third objective allowed the construction of two other conclusions:

**Conclusion 3': The trainings promoted by the PNAIC led to reflections about the pedagogical practices by the literacy teachers.** Reflecting the Conclusion 3 highlighted above, but coming from investigations with different objectives. Some examples:

*Even in the face of difficulties, the training provided to the literacy teachers the creation of pedagogical practices that stimulated the students to build the mathematical concepts. ([07] SOUZA, 2016)*

*(...) the need of understanding the continuing training as an action-form was evidenced, where sharing is an essential element, because it can inspire new practices that request for new actions, in a constant movement of action-form. ([19] ANDRADE, 2017)*

*More than an opportunity to recognize and systematize the experience knowledges, the program proposes the reflection about the practice of these teachers. ([27] SANTOS, 2015)*

**Conclusion 4: The trainings promoted by the PNAIC showed weaknesses.** Some examples:

*At the national scope, it is clear that there is a discontinuity of the process with the political changes suffered in the the federal government. In the creation and implantation of the Pact, we found the negotiation of the municipalities adhesion, adhering to the contents and implantation forms, without much modification possibility. (...) many contents and concepts discussed in the PNAIC materials were in conflict with the practice from São Paulo city. The choice of the training university also presented problems. All the schools were not involved in the implementing process of the Pact. In the two researched schools, we noticed that the Pact was nothing more than a training course, and, in one of them, there was no participation of the researched teachers. Both had illiterate children at the end of the third year of the Literacy Cycle in 2013, (...). ([15] BARROS, 2017)*

*Through the analysis of the subjects' reports, the formation of the PNAIC presented theoretical weaknesses, therefore, not offering enough contributions to promote changes in social quality practices. Still through the analysis, based on the theoretical references on which the research was based, it appeared that the program in question was based on the practice epistemology, linking the educational quality to the logic of results. ([34] BORGES, 2017).*

## The *PNAIC* in perspective

The context of the practice involving the *PNAIC* was moved from a set of masters and doctors degrees researches carried out in the period from 2014 to 2019, most of which were produced in the South and Southeast regions of Brazil, and in public higher education institutions. The relation between the researches realized and the illiteracy rate indicates the need for equitable research development in all Brazilian regions, because without them there is a lack of elements that allow a good diagnosis of the situation, what makes it difficult and, sometimes, prevents the development of effective and coordinated actions between the cities in the same State.

Another important question is related to the need for remaining focused on the objectives and goals of the National Education Plan, creating subsidies for a new Educational Agenda. In this Agenda, for example, the production of collaborative-cooperative researches should be contemplated since these researches would favor and direct the dissertations and theses production with more comprehensive evaluations than the *PNAIC* was in terms of National Public Policy, taking as *corpora* each component that constituted it, to know, the people, the educational institutions, the governmental entities (municipal, stadual and federal), the curriculum materials (*PNAIC* notebooks),

the school subjects involved, the cultural, social, economic, educational, ideological and political dimensions-components that interfere in the achievement of a public policy with this magnitude.

The organization and direction of the researches were abundant in some topics, such as the literacy teachers reflection, and it was scarce in addressing things such as the relationship between the Training Notebooks and the local curricular indications, what was contemplated by only two works ([60] PUGAS, 2018; [68] GIARDINI, 2016) among the forty-one selected. Most of these researches considered the literacy teachers point of view and this is correct if we think that they are at the frontline of the teaching and learning processes, but there is a gap if we think that these teachers strongly depend on the conditions given by a set of actions and instances so that they can develop well their work in the classroom.

The conclusions produced by the examined researches showed, predominantly, that the trainings promoted by the *PNAIC* favored changes in the pedagogical practices of the literacy teachers, however, none of the carried out researches had a longitudinal character that allowed to evaluate how representative these changes were. It is Worth to reflect if these changes did not represent homeopathic and palliative doses for the chronic problem of the teaching profession valorization in Brazil.

In this sense, some conclusions associated to the objective 1 indicated that the trainings promoted by the *PNAIC* are necessary, but they were not enough to combat the illiteracy, since only an articulated set of public policies developed in medium and long term may will drastically reduce the illiteracy percentage. Still in this direction, some conclusions associated to the objective 3 indicated that the trainings promoted by the *PNAIC* presented weaknesses that, saying in a simple way, relate to the economic-political dimensions-components.

In general, at the end of this study, it is worth to highlight an absence: although we took the keyword “Mathematical literacy” as a starting point for the analysis and the selected works had as a predominant focus the reflections of the literacy teachers about the training developed from the Mathematical Literacy Notebooks from the literacy perspective, there is no criticisms directed at these notebooks content and, at the same time, there is also no record in relation to the specific difficulties related to the mathematical contents, although a good part of the literacy teachers is not close to the work with these contents and some even express “fear”. In one hand it is shure that the *PNAIC* training activities promoted a wide reflection of the

literacy teachers about their classroom practices, inserting in the list of these reflections some concerns related to the mathematical contents development, but, on the other hand, even the dissertations and theses that brought their eyes closer to the “Mathematical Literacy” object did not highlight, in their conclusions, elements that are indicative of changes evaluation (significant or not) in relation to the work practices with these contents.

To protect and take care of Brazilian people, minority provided with essential human rights, is the social action that the Brazilian State, through public-private powers, need, constitutionally, to put on the schedule of the municipal, state and federal governments. The existence of a program with the *PNAIC* dimensions reflects that, at some time, the political leaders across the country were engaged in the pact for the literacy, despite of all political and party differences. However, the discontinuities in the process and the changes of theoretical-methodological orientation, with the frequent knowledge and practices distancing developed by the innumerable university institutions in the country let all and any possible positive effect disappear, mainly when taking into account the high evasion index registered for the teaching profession in the initial years of schooling, which leads us to suppose that in a short period of four years (a government mandate), all resources spent on training strategies have been lost with the interruption of the continued actions. There remains, in disuse and privately (the material belonged to teachers), all the printed and nationally distributed Notebooks, as well as all the specific production, of each institution and each Trainer, for the training courses.

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