

## Continuing education of teachers and the curricular document of Roraima: Mathematical knowledge in early childhood education



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### ABSTRACT

The multiplicity of issues involving teacher training is extensive and this article focuses on some factors related to aspects of continuous training according to the Curricular Document of Roraima in the light of BNCC and the inclusion of mathematical knowledge in the five Fields of experiences in early childhood education. It is noteworthy that there is caution in the approach of mathematics in early childhood education, because what is aimed at this

stage is not to develop only the object of knowledge, but mathematical thinking. The research, qualitative in nature, was conducted with teachers who teach in early childhood education and discuss in the school environment the relevance of continuing education and curriculum. The research aimed to analyze the continuous training as a means of expanding the knowledge and reflection about the teaching work in relation to didactic planning and the integration of mathematical knowledge in the experience fields. Therefore, the question is: "How does the continuous training contribute to the implementation of the didactic planning of the early childhood education teacher, making him/her realize that all the experience fields can be permeated by mathematics? For the research, it was used as instrument in the collection of the data a questionnaire applied to 12 teachers participants of a continuing training Workshop and that exercise their functions in the municipal education network of Uiramutã-RR. It is noticed in the results that the conceptual discussions and the planning practices proposed in the continuous training allowed to establish relations between the different mathematical contexts and the experience fields.

**Keywords:** Teaching work, Fields of experiences, Mathematics in Early Childhood Education.

### 1 INTRODUCTION

The contribution to the construction of a fairer society points to the school as a space of multiple knowledge and that has in the figure of the teacher the challenge of teaching, accompanying, guiding and evaluating the actions for the consolidation of a teaching work in a conscious way. In this scenario, it is necessary a teacher involved with the formation that actively participates in the situations of organization of teaching and that the interactions with the knowledge propitiate the transformation of the common sense to a scientific approach. With this, the teacher should not be a mere transmitter of contents, it is necessary that continuing education be seen as a broad, complex and continuous teaching action.



During the last decades, many changes have occurred in the social and political life of individuals and with education it could not be different. It is important to make a counterpoint and rethink the attributions of the teacher as an education professional, his political and reflective commitment to his practice. For this, it is necessary a space to rethink the issues of teaching practice and the means of enhancing discussions that meet the intention of professional qualification linked to the collective criticality of those who make up the teaching and learning process.

The continuing education in the scope of early childhood education should meet specific situations and places where the teacher is inserted, with this approach becomes more feasible its realization in the school space. Making an excerpt of the continuing education of the Curricular Document of Roraima (DCRR) proposed by the Support Program for the Implementation of the National Common Curricular Base (ProBNCC) the research highlights the inclusion of mathematical knowledge in the five Fields of experiences of early childhood education, taking care not only to evidence the development of the object of knowledge, but rather to propose some possible connections between the mathematical study and those of the Portuguese language.

The research aims to analyze continuing education as a means of expanding knowledge and reflection on teaching work in relation to didactic planning and the integration of mathematical knowledge in the fields of experience. A questionnaire applied to 12 teachers participating in a continuing education workshop (DCRR / ProBNCC) and who perform their functions in the municipal school network of Uiramutã-RR was used as an instrument for data collection. The methodology was descriptive qualitative and the analysis of the data collected, through the questionnaires, was systematized from: "How does continuing education contribute to the implementation of the teacher's didactic planning, of early childhood education, making him realize that all fields of experience can be permeated by mathematics?".

With this perspective the article brings a discussion about the formation in the school space, the Fields of experiences in early childhood education with approach on mathematical knowledge. Next, it deals with the methodological procedures adopted and the results of the analyses of what the teachers said. By way of the final considerations, some possible referrals on the issue of continuing education of teachers working in early childhood education with a focus on the fields of experience are presented. It is worth mentioning that this study was part of a Communication at the academic event XVII National Day of Linguistics and Philology of the Portuguese Language, held at the State University of Roraima.

## **2 THE SCHOOL: SPACE FOR CONTINUING EDUCATION FOR THE TEACHER**

The diversity of aspects that go beyond all the demand of continuing education is very extensive and is related to the progress of the school, the teaching profession, the curriculum and the learning of



students. Being a teacher is designed to be ahead of the teaching of contents in the classroom, the training has in itself particularities pertinent to teaching, In this sense they leave in evidence the teachers, their knowledge and their professional experience in the search for reflections that transpose the teaching profession. As Freire (2001) points out:

the task of teaching is a professional task that, however, requires loving-kindness, creativity, scientific competence, but rejects the scientist narrowness, which requires the ability to fight for the freedom without which the task itself withers (FREIRE, 2001, p.10)

In order to understand the pedagogical practices within the school space, it is necessary to know the teacher, his initial training and how this was built throughout his years of professional practice. The process to become a teacher is long, full of many learnings and with an indeterminate end (NÓVOA, 1992). Thus, in the course of teaching performance, continuing education, in the character of professional development, should enable a resignification of pedagogical practice, create from a context new circumstances and stimulate new possibilities for the teacher's performance. The school environment is the field of production of the teacher, this should be the stage for the formation to happen without neutralities and that it can be understood that the educator interacts, produces, acts and perceives the reality inside and outside the school as a condition for the teaching work to be consolidated.

When analyzing continuing education as an action inherent to the teacher's doing, the possible transformations of his pedagogical practice and the probable changes in the school context, it is worth highlighting the discussions raised by Schön (2000) around three aspects: reflection of practice, reflection on practice and on the reflection of reflection on practice. When the teacher reflects on everyday issues as a problem situation and does so at the same time as he experiences this situation, it is the reflection of action. However, when this professional reflects after the action, in retrospect, it is the reflection on the action, and finally, when the teacher seeks to understand the action seeking meanings and alternatives of solution to that situation, he is carrying out the process of reflection on the reflection of the action.

From this perspective, continuing education has the function of contributing significantly to the development of the teacher's professional knowledge in order to sharpen the reflective capacities about the teaching practice itself, expanding it to a collective consciousness. In this way, a privileged space is conquered by consenting to the approximation between the process of change expected in the context of the school and the intentional reflection of the teachers. Thus understood, continuing education provides the experimentation of the new from the professional experiences that occur in the school space.

For Zeichner (1992 apud PIMENTA, 2002, p.26), "reflective practice, as a social practice, can only be carried out in collectives, which leads to the need to transform schools into learning



communities in which teachers support and stimulate each other". The school as a place of formation of its own teachers has an emancipatory dimension in the process that triggers the conditions of institutional and social change that is desired from the teaching work. It is considered that reflection provides the opportunity to pay attention to the student, their degree of understanding and their difficulties, favoring an educational process permeated by dialogue.

## 2.1 THE FIELDS OF EXPERIENCES IN EARLY CHILDHOOD EDUCATION: MATHEMATICAL KNOWLEDGE

The contact with mathematical knowledge arises in the lives of children from a very early age, they listen and talk about quantities, make comparisons, groupings, order, solve problem situations, follow the marking of time made by adults, compare sizes, spaces, distances and many other concepts. This knowledge, even if it appears in a "disorganized" and/or "mixed" way with other knowledge, will vary according to the culture and social environment to which the children are inserted and will constitute the starting point for new learning. To articulate these lived experiences, it is necessary that in early childhood education situations are provided that challenge them and allow this initial knowledge to be expanded and systematized.

The Curricular Document of Roraima in the light of the BNCC brings the organization of the experiences that must be lived by the children of education and opportunized by the teachers, structured in five Fields of experiences: The I, the other and us; Body, gestures and movements; Listening, speaking, thinking and imagining; Strokes, sounds, colors and shapes; and Spaces, times, quantities, relations and transformations. These experiences should be related to the reality of the children and with evidence in the various languages, social and cultural practices and not only in the object of knowledge, since the focus should be given to the experiences and no longer in the activities.

According to Barbosa and Richter (2015), it is understood that:

The curricular organization by Fields of Educational Experience enables teachers to constitute a more up-to-date and complex understanding of the areas of knowledge and academic disciplines, as they favor the visibility of the interrelations between them (BARBOSA AND RICHTER, 2015, p.192).

Teaching mathematics to children is to introduce them to activities that involve asking questions, seeking solutions, experimenting, making mistakes, analyzing, correcting, explaining procedures and results, respecting the other, proving their claims, establishing agreements, among many other actions. For all these actions to be carried out effectively it is necessary to have a series of favorable conditions, in the sense given by the child to the activity and also to the learning that they are expected to achieve. The systematized work with diversified situations can provide an easy integration between the areas, especially with the Portuguese language.



According to Fonseca (2014) the link between reading and writing and mathematics has its importance due to the favorable consequences in reading practices at school. Certainly there are many texts that circulate socially that express the mathematical language, but this language will only have meaning for children of early childhood education if there is a work integrating these areas and the proposed fields of experience.

Lopes (2009) corroborates this discussion when he points out that

The reading of texts that have as object mathematical concepts and procedures, history of mathematics or reflections on mathematics, its problems, its methods, its challenges can, however, much more than guide the execution of a certain technique, add elements that not only favor the constitution of meanings of the mathematical contents, but also collaborate for the production of meanings of mathematics itself and its learning by the student (LOPES, 2009, p. 66).

Therefore, for all this discussion to be effective in early childhood education in an adequate way, teachers demand to have in their formations challenging issues that stimulate the esteem for mathematics so that it is possible to establish a link to the other areas of knowledge. For the authors Migueis and Azevedo (2007) there is a differentiation between the teacher who teaches the child only to repeat the concept of the one who teaches the resignification. Therefore, it is necessary that the teacher when planning his classes is motivated to do so, always based on the needs that the children bring with them making them effectively concrete in the experiences that permeate the different Fields of experiences.

### **3 METHODOLOGICAL PROCEDURES: RESEARCH DIRECTION**

To achieve the problematized objective, it was initially sought to expose the composition of the rules that involve the research, regarding the objectives, their typology and the procedures adopted. The research presents a study with a qualitative approach, which according to Severino (2007, p.119) concerns "a set of methodologies, involving, eventually, several epistemological references". Descriptive as to the objectives, the research seeks the appreciation of the information collected through an open questionnaire, because "the subject can elaborate the answers, with his own words, from his personal elaboration" (SEVERINO 2007, p.126). The use of the instrument is justified by portraying in the information collected through writing, the subject's conception about the theme under study.

The trainings for the implementation of the DCRR in the light of the BNCC took place in 07 of the 15 municipalities of Roraima. The target audience reached had as an estimate 361 teachers of early childhood education and 1,422 of elementary school (1st to 9th grade and multigrade classes), who work in schools located in urban and rural areas of the municipalities. To define the participants of the research, the sampling technique was used, since it was necessary to select the population to



perform the analysis, since the research approach refers to teachers of early childhood education. For Gil (2010), when the sample is properly selected, there is a greater possibility that the results obtained establish a relationship close to that of as if all had been researched.

In this case, the criteria for sampling were established and the portion of the population selected was a class of 12 teachers of early childhood education participating in the Continuing Education Workshop, working in the municipality of Uiramutã-RR. The choice of this municipality was given because this is the most distant municipality from the capital Boa Vista-RR (315km) and therefore is the region with the vast majority of schools in conditions of difficult access. With this choice, it was also intended to perceive the scope of the information treated in the workshops and the participation of the actors involved in this action.

#### **4 CONTINUING EDUCATION AND THE MATHEMATICS PRACTICE IN EARLY CHILDHOOD EDUCATION: WHAT DO TEACHERS SAY?**

For teachers to gain autonomy and have responsibility for their own professional growth, it is necessary to constantly seek transformations directly linked to their professional practice. With this, the continuing education managed by the school expands a unique space for the construction and debate of knowledge, as it provides teachers with moments of reflection on practice, the exchange of experiences between peers and the extrapolation of these discussions beyond the classroom.

During the development of the workshop held with the teachers of early childhood education, interactive panels were used with questions directed by the problem posed: what is your conception about the Fields of experiences? How do you relate the fields of experience and the various areas of knowledge? How do you elaborate the didactic planning considering the learning objectives, the Fields of experience and the mathematical knowledge? The approaches were carried out during the training and the teachers were able to expose, in written and oral form, their positions.

From the results were highlighted some statements that appeared more frequently expressed by the participating teachers (these were identified by P1, P2, P3, P4). In the approaches of the interactive activity, the most significant statements of the teachers for this study are presented, according to each question discussed. Then, regarding the knowledge of the Fields of Experiences, the teachers stated that they were able to expand their knowledge about it and that they can identify the Fields and build the planning from the guidelines of the DCRR.

P1 – I believe that these are the main axes that can be worked on in early childhood education.

P2 – I use the experiences already lived by the children and plan in an integrated way with playing, interacting, participating, exploring, expressing and knowing.



P3 – Teacher, I am new to early childhood education and I have many difficulties in relation to planning with fields of experience.

When the discussion and reflection on didactic planning and how the Fields of experiences were considered are opportunized, there are reports of improvements and even changes in pedagogical practice to contemplate in the planning studies that contribute to the needs and activities of children in the classroom:

Q1 – We must organize step by step from a diagnosis in which the theory is reflected in practice.

P2 – Organizing the six Learning Rights and the five Fields of Experiences, so that from the language of the children can extract the object of knowledge and thus deepen the experiences lived in the class.

P3 – As a teacher of early childhood education I need to know more. But a child's experiences are observed on school days and I believe they bring to school the experiences they learned at home.

P4 – I still find it difficult to plan given the Fields of experience.

What is perceived in the speech of the teachers is that the schools have been able to provide opportunities for discussions about planning in an integrated and articulated way between the rights of learning and the fields of experiences, so that they are integrated into the experiences of the children. Even if difficulties still arise, gradually the orientations and continuing education with the pedagogical teams responsible for the action have been having an effect on the teacher's practice. Thus, the work with the Fields of experiences " (...) consist in understanding an idea of curriculum in the school of early childhood education as a strongly educational context, which stimulates the child to give meaning, reorganize and represent their own experience" (Fochi, 2015, p. 221-228).

With the progress of the third moment of the Workshop, the last interactive panel brought the question to the teachers who reported their knowledge about planning considering the Fields of experience, highlighting mathematical knowledge and other knowledge. They described that:

Q1 – I have some difficulties in planning in an integrated way.

P2 – I try to plan in an integrated way always taking advantage of what children already know, including about mathematical knowledge and language.

P3 – I develop my planning considering first the linguistic knowledge and from the articulated language with the other areas.

It is also noteworthy that when teachers are asked about how they develop planning associating mathematical knowledge and other experiences, including specifically those that deal with language, it is perceived that there are still many difficulties in articulating planning to the principles of the Fields



of experience, since the conception of the Fields is centered on the dimensions of knowledge, of social practices and languages.

As a way to reduce the fragmentation and the performance of decontextualized activities that children live in school, it is necessary to systematically organize the situations that happen in the day to day and the way teachers should continue and expand the children's creations. It is necessary, as Carvalho and Fochi (2016, p. 165) affirm, to differentiate the value of daily life "as a unit of wholeness of life constituted by several threads - temporalities, spatialities, relations, languages - that are established in the school".

This time, it is evident the need for continuing education that points to the issue of changes in practice, even though, this same conception does not manifest itself so quickly in the practice of the teacher. It is interesting to highlight in the analysis of this discussion that the school is imputed a significant value in the training process, even if there are still failures in the internalization of the theory and its assimilation with the practice in the classroom. It can be emphasized that in the teachers' statements there are coherent considerations to the proposal of a continuing education that propitiates the reflection on the practice and, in general, evidences the study as an important instrument of teacher formation.

## 5 FINAL CONSIDERATIONS

The main focus of the investigation was to analyze continuing education as a means of expanding knowledge and reflecting on the teaching work in relation to didactic planning and the integration of mathematical knowledge in the fields of experience. The discussion about the merit of continuing education in the school space as a means of expanding knowledge and reflection on the work of the teacher of early childhood education occurred in a way that led them to perceive the strengthening of teaching practice. Thus, from the statements of the teachers involved in the training process, it was possible to verify that the relationship between theory and practice in the view of the teachers has approached the reality of their work, even if in some moments it is difficult to establish this relationship.

The moments of absence of reflective practice in continuing education oscillate between being able to foster significant changes on the one hand and on the other, still points out the need for greater interaction between the formative pairs to minimize the difficulties of theoretical resignification and the practical issues of the classroom. However, the group values continuing education from the school and the changes that occur in their practices and believe that this tool directly affects the reflection of teaching practice.

The movement of change of practice from studies that meet the needs of the moment in the school environment was verified with the investigation. The contribution of continuing education in





the school among its teachers of early childhood education indicates, in their view, that the demands of training themes that evidence the reflective aspect in their work are met. Thus, the investigation was able to analyze the contribution of continuing education in the school space as an action that provides the development of its professionals, their scope and limits in relation to the subjects involved in the training process.

It is worth mentioning that, due to its relevance, it is important to highlight that in the intention that it can be a possible contribution in the elaboration of new knowledge regarding the reflections on the themes of the area, it is expected that in view of the pedagogical practices developed within the classrooms and the concern with the formation of the students, the discussions will be pertinent to perceive a better society, with responsibility in the idealization and elaboration of a curricular proposal that provides actions to promote, expand and constitute new knowledge for children.

The research brings relevant aspects when it portrays the profile of the participating teachers who work with the pedagogical practices developed within the classrooms and the concern with the formation of the children, where the discussions are pertinent. It is noticed, therefore, that the conceptual discussions and planning practices proposed in continuing education allowed establishing relationships between the different mathematical contexts and the fields of experience.



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