EXPLORING EXPERIENCES IN SCIENCE AND MATHEMATICS EDUCATION: DIALOGUES IN A PEDAGOGY COURSE

EXPLORANDO EXPERIÊNCIAS NA EDUCAÇÃO EM CIÊNCIAS E MATEMÁTICA: DIÁLOGOS EM UM CURSO DE PEDAGOGIA

EXPLORANDO EXPERIENCIAS EN EDUCACIÓN CIENTÍFICA Y MATEMÁTICA: DIÁLOGOS EN UN CURSO DE PEDAGOGÍA

Jonatha Daniel dos SANTOS[1]
e-mail: profjonathadaniel@ufam.edu.br

Rozane Alonso ALVES[2]
e-mail: rozanealonso@ufam.edu.br

Vanessa da Conceição Nascimento PEREIRA[3]
e-mail: vanessapereira16303@gmail.com

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[1] Federal University of Amazonas (UFAM), Manaus – AM – Brazil. Adjunct Professor in the Department of Methods and Techniques (DMT) at the Faculty of Education (FACED). Permanent Professor in the Postgraduate Program in Science and Humanities Teaching (PPGECH/UFAM).

[2] Federal University of Amazonas (UFAM), Manaus – AM – Brazil. Adjunct Professor in the Department of Methods and Techniques (DMT) at the Faculty of Education (FACED). Permanent Professor in the Postgraduate Program in Science and Humanities Teaching (PPGECH/UFAM).

[3] Federal University of Amazonas (UFAM), Humaitá – AM – Brazil. Master's student in the Postgraduate Program in Science and Humanities Teaching (PPGECH).

ABSTRACT: The text on screen aims to present the analyses carried out from the teaching practices produced during the year 2022 and 2023 with the disciplines of Content and Methodology of Science Teaching, The Child and Mathematical Language and Content and Methodology of Mathematics Teaching that are part of the curricular composition of a course in Pedagogy, in the Northern Region of Brazil. It is part of a qualitative research, based on the Field of Cultural Studies, which allows, as a procedure of analysis and production of data, to act with cultural analysis from an autoethnographic instrument. Through the experiences it was possible to perceive that the paths in initial training are changing, however, by producing experiences and being affected by it, the pedagogical and reflective possibilities are enhanced in this context. In this sense, we argue that creativity and innovation without experience, without the possibility of being affected, is nothing more than the assimilation of information. In such a way, by experiencing and moving in the process of teaching, seeking to learn with, about and from the elements that constitute not only the teaching practice, but our identities, it makes us subjects of experience.

KEYWORDS: Initial Training. Pedagogy. Sciences. Mathematics. Experience.

RESUMO: *O texto em tela tem o objetivo de apresentar as análises realizadas a partir das práticas de ensino produzidas durante o ano de 2022 e 2023 junto as disciplinas de Conteúdo e Metodologia do Ensino de Ciências, A Criança e a Linguagem Matemática e Conteúdo e Metodologia do Ensino de Matemática que se inserem na composição curricular de um curso de Pedagogia, na Região Norte do Brasil. Parte de uma pesquisa qualitativa, pautada no Campo dos Estudos Culturais, que permitem enquanto procedimento de análise e produção dos dados atuar com a análise cultural a partir de instrumento autoetnográfico. Por meio das vivências foi possível perceber que os caminhos na formação inicial são cambiantes, todavia, ao produzir experiências e por ela ser afetado, as possibilidades pedagógicas e reflexivas são potencializadas neste contexto. Nesse sentido, defendemos que criatividade e inovação sem experiência, sem a possibilidade de ser afetado, nada mais é do que a assimilação de informações. De tal forma ao experienciar e nos movimentar no processo de ensinar, buscando aprender com, sobre e a partir dos elementos que constituem não apenas o fazer docente, mas nossas identidades, nos torna então, sujeitos de experiência.*

PALAVRAS-CHAVE: *Formação Inicial. Pedagogia. Ciências. Matemática. Experiência.*

RESUMEN: *El texto en pantalla tiene como objetivo presentar los análisis realizados a partir de las prácticas docentes producidas durante el año 2022 y 2023 con las disciplinas de Contenidos y Metodología de la Enseñanza de las Ciencias, El Niño y el Lenguaje Matemático y Contenidos y Metodología de la Enseñanza de las Matemáticas que forman parte de la composición curricular de una asignatura de Pedagogía, en la Región Norte de Brasil. Forma parte de una investigación cualitativa, basada en el Campo de los Estudios Culturales, que permite, como procedimiento de análisis y producción de datos, actuar con el análisis cultural desde un instrumento autoetnográfico. A través de las experiencias se pudo percibir que los caminos en la formación inicial van cambiando, sin embargo, al producir experiencias y ser afectado por ellas, se potencian las posibilidades pedagógicas y reflexivas en este contexto. En este sentido, sostenemos que la creatividad y la innovación sin experiencia, sin posibilidad de verse afectada, no es más que la asimilación de la información. De esta manera, al experimentar y moverse en el proceso de enseñanza, buscando aprender con, sobre y desde los elementos que constituyen no solo la práctica docente, sino nuestras identidades, nos convierte en sujetos de experiencia.*

PALABRAS CLAVE: *Formación inicial. Pedagogía. Ciencias. Matemáticas. Experiencia.*

Introduction

Being in the position of training teachers who, at a certain point, will be able to exercise the profession of teaching mathematics and science is an exercise that requires us, higher education teachers, constant ruptures between what has historically constituted us as teachers and in itself, our professional identities and the possibility of being in constant movement, or rather, being on the borders, between what is perceived as necessary to 'teach' and what is urgent to contextualize. These paths are changing, especially due to the vast theoretical and practical direction, possible to be worked on and compose our pedagogical and evaluation practices.

The changing paths are produced by experiences aligned with the profile of a training that visualizes everyday realities and that in a certain way produces, in their ambivalences, reflective teachers, both in their own pedagogical practice and in the scenarios that circulate the different Brazilian school contexts.

In the field of experience, these are the ones that help and direct us to visualize the realities experienced at school, especially their particularities, possibilities and challenges. On the other hand, experiences mark us, sometimes in the field of university teaching, sometimes from the perspective of promoting actions within the scope of initial and continued training that contribute so that, even minimally, it is possible to look at old challenges from new perspectives, taking into account the adventures that are taken in the field of education.

Regarding the experiences that produce and form us as subjects of this space, it is possible to dialogue with Larrosa (2011), since the experience touches us, affects us, moves us and gives new meaning to our teaching identity while offering places in which we can reinvent ourselves and identify paths capable of being adapted/innovated/articulated in the face of the challenges of school education, observing the importance of school, that is, learning through reflection in action.

In this sense, we argue that creativity and innovation without experience, without the possibility of being affected, is nothing more than the assimilation of information. And being informed does not mean experiencing, therefore, experience is constituted by movements that direct towards possibilities in which people inserted in the pedagogical process of initial training can exist and re-exist in the events generated through the pedagogies in which a certain 'discipline' is being contextualized.

In this way, experiencing pedagogical situations that affect and produce us is certainly a break with the modern and Cartesian ideal of thinking and implementing paths regarding the training of teachers at the university level.

It is from this perspective that this text will follow, highlighting the forms and situations in which it is possible to provoke in the students of the Pedagogy course and in us, the teacher trainers, small impacts, responsible for the displacement between tradition and contemporary times. To achieve this, two conceptual and working fields are necessary for the tensions present in this discussion, namely Science and Mathematics Education. Both seek to build meanings in the sense of learning through reflective and critical dialogues, in addition to exposing the importance of narratives that are sometimes disregarded in school contexts.

Thus, the text that follows seeks, as a central objective, to present the analyzes carried out based on the teaching practices produced during the years 2022 and 2023 together with the subjects of Content and Methodology of Science Teaching, Children and Mathematical Language and Content and Mathematics Teaching Methodology, which is part of the curricular composition of a Pedagogy course, in the Northern Region of Brazil.

Along this path, the article consists of a section that aims to present the field of research, briefly exposing the curricular components necessary for data production. After this initial dialogue, some formative experiences, which we call 'moments of experience', are contextualized in light of our perceptions and affects. Finally, some provisional considerations are highlighted, taking into account the reality and particularities of the Amazonian scenario from Science and Mathematics Education.

Field of research and paths to data production

The course in question is based in the city of Manaus, linked to the Faculty of Education (FACED) at the Federal University of Amazonas (UFAM), Northern region of Brazil. It was created on June 30, 1970, according to Decree 66,810, consisting of the following departments: Department of Theories and Fundamentals (DTF); Department of Methods and Techniques (DMT) and Department of Administration and Planning (DAPLAN). Currently, FACED has four departments, the previous three and in the current context with the Department of Indigenous School Education (DEEI).

Its duration is 5 years and is aligned with the field of activity of the Graduate in Pedagogy, which must be composed of the following dimensions: Teaching in Early Childhood Education; Teaching in the Early Years of Elementary School; Education Management and, Production and Dissemination of scientific and technological knowledge in the educational

field. Currently the course is offered in the morning and afternoon, with 4 classes joining each academic year, two in the morning and two in the afternoon.

Throughout training, there are four subjects in which the objectives are based on interaction with knowledge produced in the field of science and mathematics. The following are worth highlighting: Children, Nature and Society (5th period); The Child and Mathematical Language (6th period); Content and Methodology of Mathematics Teaching (7th period); Content and Methodology of Science Teaching (8th period).

In ' The Child, Nature and Society ' the proposal is to offer students ideas that dialogue with the child's representations of the natural world, people and themselves, as well as notions of nature and society. On the other hand, in 'Content and Methodology of Science Teaching' it seeks to present the basic contents of science for the Early Years, emphasizing scientific literacy and environmental education.

In the subject 'The Child and Mathematical Language', according to the course's Pedagogical Project (2019, p. 64), the proposal is to discuss the construction of logical-mathematical knowledge of children enrolled in Early Childhood Education and understand the context of mathematical language in the context of multiple languages. In turn, 'Content and Methodology of Mathematics Teaching' dialogues with the thematic units present in the National Common Curricular Base (BNCC), especially with the trends relevant to the initial years of primary education.

The didactic exercise in these four listed disciplines are bases for the materialization of the production of experiences within the scope of the undergraduate course, necessary for the production of this article, especially for the context of evaluation, a fact that deserves attention, taking into account that the evaluation it should not only be linked to the quantitative factor, but with it, be part of a universalization of knowledge and strengthening of didactic, pedagogical, theoretical, practical and other principles that emerge when the teaching of science and mathematics is discussed.

The dialogue with Mathematics Education occurs to the extent that it proposes other perspectives and other epistemologies for doing and thinking about Mathematics as a disciplinary and scientific field. Therefore, it is a possibility of understanding other knowledge and practices of socially distinct groups, avoiding the epistemic control formatted in Mathematics in modern times. Bicudo and Garnica (2011) report that Mathematics Education will be a vague expression if it is not reflective and filled with meaning that comes from practice. Thus, mathematical education takes place as a reflection in action.

On the other hand, when mentioned about Science Education, we will be articulating this based on the training of multipurpose teachers, that is, those who are in the process of initial training in the Pedagogy course. Just like Mathematics Education, this initiative proves to be effective when designed and problematized in a locus that highlights, within the challenges, the possibilities of teaching and learning science, for children sometimes in the context of Early Childhood Education, sometimes in the Early Years of Elementary School.

The classroom, the materials, the experiences, the dialogues, the learning, the re-significations, all of these and others constitute the methodological basis of this text, especially for data production and analysis. The experiences produced by the teachers, author of this work, come exclusively from their classes developed in the Science and Mathematics Laboratory, and do not involve students from the aforementioned course and/or discipline.

In view of this, the investigative research proposal that constitutes the narratives present in this work is based on qualitative research, taking into account the discussions of Rey (2005) when it reflects the production of knowledge as an understanding of the fields being researched and the dynamicity to which the researcher brings to theoretical relationships addressed throughout the development of the research.

Based on the basis that the act of research involves subjective elements (Rey, 2005), this work proposes to work from the theoretical-methodological perspective of Cultural Studies, which presents itself as a field of negotiations between theories, methods and methodologies, not fixing specific ways of doing/producing research. Cultural Studies tries to emerge as a space for "producing new knowledge about the ways in which sociocultural processes are involved in the construction of our conceptions about the world" (Kirchof; Wortmann; Costa, 2015, p. 8, our translation).

As a mechanism for analyzing the narratives produced by the teachers, authors of this work, within the scope of developing teaching activities, in a training context, cultural analysis was used as a procedure for perceiving oneself as a subject who forms pedagogical practices and, in this training, constitutes (beginning) teaching identities.

Cultural analysis starts from the conjunctural perspective to which the subjects are involved and helps in the construction of "responses to the immediate pressures of the time and society in which they were written, or were focused on or organized by such responses" (Hall, 2003, p. 133, our translation). Provisional answers, but which enable the perception of the ways of being, in this case, of the teaching practices produced by teachers of the aforementioned subjects.

For data production, autoethnography was used to think about both the teaching strategies that made up class moments based on the teaching practices developed, as well as a dimension of the production of teaching materials developed by teachers and applied in moments of training and evaluation.

Autoethnography, according to Ellis and Bochiner (2000, p. 47, our translation) "allows the researcher's involvement, as well as the narrative of his thoughts and reflective opinions, in relation to the study in which he is inserted". It makes autoethnography a methodological instrument that "enables the author to transpose all these emotional experiences into his study, revealing hidden details of private life. To this end, the description of social life and its relationships needs to be as complete and engaging as possible."

Therefore, through our teaching experience in the disciplines in question, because we are as researchers and participants in the research universe, affecting and being affected by the experiences, the data were produced in this cultural context with the possibility of creating dialogues between the space of university education, school and, above all, the subjectivities that go through this ambivalent and necessary process to reflect on the teaching role in the context of Sciences and Mathematics.

Training experiences within the scope of initial training for teachers

The discussion in this topic aims to explore and present the process of constitution of the disciplines presented previously, with a view to dialogue with the production of experiences that now affect us as a teacher who is in the role of trainer, as well as for the students who go through a continuous flow of new learning and, along the way, propose dialogues about the ways of learning acquired from their experiences.

Furthermore, they also talk about their ways of visualizing the context in which they live, at the same time as they visit their own pedagogical practices, since most of the students on the Pedagogy course either participate in an internship in public/private schools, or are linked to some government program, for example, Institutional Program for Teaching Initiation Scholarships (PIBID) and Pedagogical Residency.

The learning generated in everyday experiences generates experiences in its final process, and in this way "something that is not me, an event, passes. But it also supposes, [...] that something happens to me. The experience presupposes an event outside of me. But the place of experience is me" (Larrosa, 2011, p. 6, our translation).

In these historical interstices that form our teaching identities, which cross us, we certainly contribute to debates in the pedagogical field as a teacher trainer, but who are also linked to these problematizations. For example, in the classes ' Children and Mathematical Language' and 'Content and Methodology of Teaching Mathematics' a question is always presented on the first day of class, namely: what are your feelings about mathematics?

Most of the answers elucidate non-affective experiences with the field of knowledge in question, exposing how fears were created through different situations. However, even with this diversity, it is possible to understand in these dialogues that the driving fear of aversion to mathematics is effective by the obligation to 'do something' without understanding what or how it is done, a classic scenario of pedagogical stance based on Logicism, Formalism or even Intuitionism.

It is important to highlight that the mention of these philosophical bases is not a refusal, which to a certain extent are present in the context of mathematics teaching, whether in universities or in basic school practice. On the other hand, it is necessary to question, problematize and establish tensions in the educational field aiming at teaching mathematics in school practices, therefore, discussions around Mathematics Education come to meet new possibilities and potentialities for the field of mathematics in the educational area.

The same situation can be seen in the historical context of Science teaching in Brazil. Santos and Galetti (2023) provide an overview of Science teaching, from the colonial period to the present day and define this history in four phases (1549–1800; 1800–1950; 1950–1970; 1970–present day). In these phases, it is possible to understand the role of some foundations, such as classical-humanist teaching, positivism and an attempt to change paradigms between 1950 and 1970, but which fell short of the training needs of Brazilian students, mainly due to a model based on repetition of the 'scientific method'. In the current phase, Santos and Galetti (2023, p. 28, our translation) write that “perhaps it is possible to characterize the current moment by the intense interest in reviewing and critically analyzing the different aspects of science teaching in order to seek ways for its continuation improvement” and this stance certainly dialogues with pedagogical, methodological, curricular and investigative processes.

In this sense, dialoguing with contemporary themes, with the aim of articulating actions that aim to deconstruct traditional scenarios and promote moments of experience, also stands out as a possibility of creating didactic situations with a view to creativity and innovation in the field of Education, whether in mathematics or science. Some situations used in classes and

which, to a certain extent, contributed to the construction of moments of experience will be presented below.

Pedagogical diary

Within the scope of graduation, an activity that offers a significant return is the Pedagogical Diary, used in subjects involving Science and Mathematics Education. In this diary, students in each class must discuss, based on their experiences, their feelings, anguish, perceptions about the context of the discipline and how they are viewing the themes presented through their production as subjects in the process of initial training. This is not a summary of the class. What matters are your reflections, your questions, your provisional considerations, your tensions, which are present in the constitution of the teaching identity.

This possibility dialogues with the writings of Clandinin and Connelly (2011) when they present the narrative by allowing us to understand the events, situations and experiences of individuals within their real contexts. Even though the pedagogical diary is in written format, we believe that its power is similar to orality, especially through the feelings that are presented in their writings, making us aware of their subjectivities and life stories in relation to the teaching of science and mathematics.

The production of the pedagogical diary, both in the subjects of 'The child, nature and society, and in 'Content and Methodology of Teaching Mathematics', sought to bring together the experiences that move learning within the scope of students' initial training of Pedagogy as they moved through the training process, bringing school narratives experienced in the context of public schools, the stage for these students' basic training.

Such narratives brought together the elements that marked the students' school and personal lives, which touches on the choice of course, how they saw science and mathematics in the context of Basic Education. In the reports narrated through the pedagogical diary, the students sought to present the circularities of life as a strategy to think about their teaching training. Mothers, students, looking at the way they educate and how they can educate through the process of experimentation, curiosity, and the constant questions their children ask.

“Can we bring academic knowledge closer to the way we educate our children”?; “What school do we intend to do, as future teachers, if with our children we do not seek to look at the desires and curiosities that drive them in the process of constant learning?” The questions narrated not only deal with issues pertinent to knowledge in science, but also demonstrate the

experiences of being with children in other spaces. Such questions move these students in the teacher training process, considering that knowledge from experience touches, affects, moves the subject, making them the subject of the experience (Larrosa, 2011).

When looking at the objects of knowledge that make up the curricular components of Basic Education, specifically, in the Initial Years of Elementary School, the reports, the notes, the clashes presented have demonstrated that the students realize that their school life, that the discussions guided in classes during the 1st to 5th year of Elementary School I, are also learning movements that constitute the teaching identity, their ways of doing and using methods, procedures and didactic-pedagogical instruments in the classroom are constituted from the your experiences as a Basic Education student.

"In this class, I learned that I need to learn to teach" [4]. In this movement of experiencing initial training, the student does not only refer to knowledge defined from a curricular matrix, which constitute training syllabi and objectives, but rather articulates knowledge that is part of the subject's basic training process.

In a class on 'The child, nature and society' we discussed the phases of the Moon, as a debate and at a certain point these students began to realize that the nuances that encourage teaching practice do not strictly refer to the theories demanded, organized and selected for a specific area of knowledge and/or discipline.

Learning to teach as a movement of circularity. Learning to teach, as a process of experiencing oneself and the contexts in which the subject moves in the ways in which he or she is constituted as a subject of experience. The narratives presented in the diaries produced in both disciplines have made it possible for us to write about what we intend to learn without taking into account how we place ourselves in this learning process.

In the diaries, the students demonstrate that when thinking about the production of teaching-pedagogical materials, they sought to think like students in their school days. The written reports show that by sequencing the activities and organizing both the production and application of these materials, shared relationships between the group members were formed. In this regard, we began to discuss, in a more intensified manner, the production, application and perceptions of teaching materials in the context of these students' initial training.

[4]Excerpt taken from the Pedagogical Diary, one of the materials produced in the context of the disciplines.

Production of teaching material

In ' The Child and Mathematical Language (6th period) and Content and Methodology of Teaching Mathematics (7th period) a certain teaching material was developed in 2022 and 2023 which should be linked to the profile of school-aged children in Education Kindergarten or Early Years of Elementary School. As a possibility for innovation and fostering the creativity of students, it was proposed that it should consist of a story (Literature), short story or song. Furthermore, it should have a didactic guide of possible (practical) activities to work with children for the chosen school year. This activity aimed to bring students closer to a scenario in which mathematics can be experienced in different situations, with the aim of promoting moments of experience for children and teachers, taking into account Brazilian diversity, especially the Amazonian scenario.

Mostly, the constitution of the material proposed to offer protagonism to the field of Literature, focusing on Children's Literature. In this case, the proposal maintained a link with the use of history, which could be original or based on the production of another author. It is important to highlight that there were several original stories that certainly contribute to the discussion of the topic in classes, two examples highlighted in Figure 01.

The use of this educational principle dialogues with contemporary research, with the aim of establishing an affective and playful relationship with mathematics teaching, which encourages creativity and different ways of thinking. In this regard, it is worth highlighting research, such as that by Alencar *et al* (2021), Borba and Guimarães (2015), Ferro, Arrais and Moraes (2021), where they discuss the potential of linking Mathematics Education to Children's Literature.

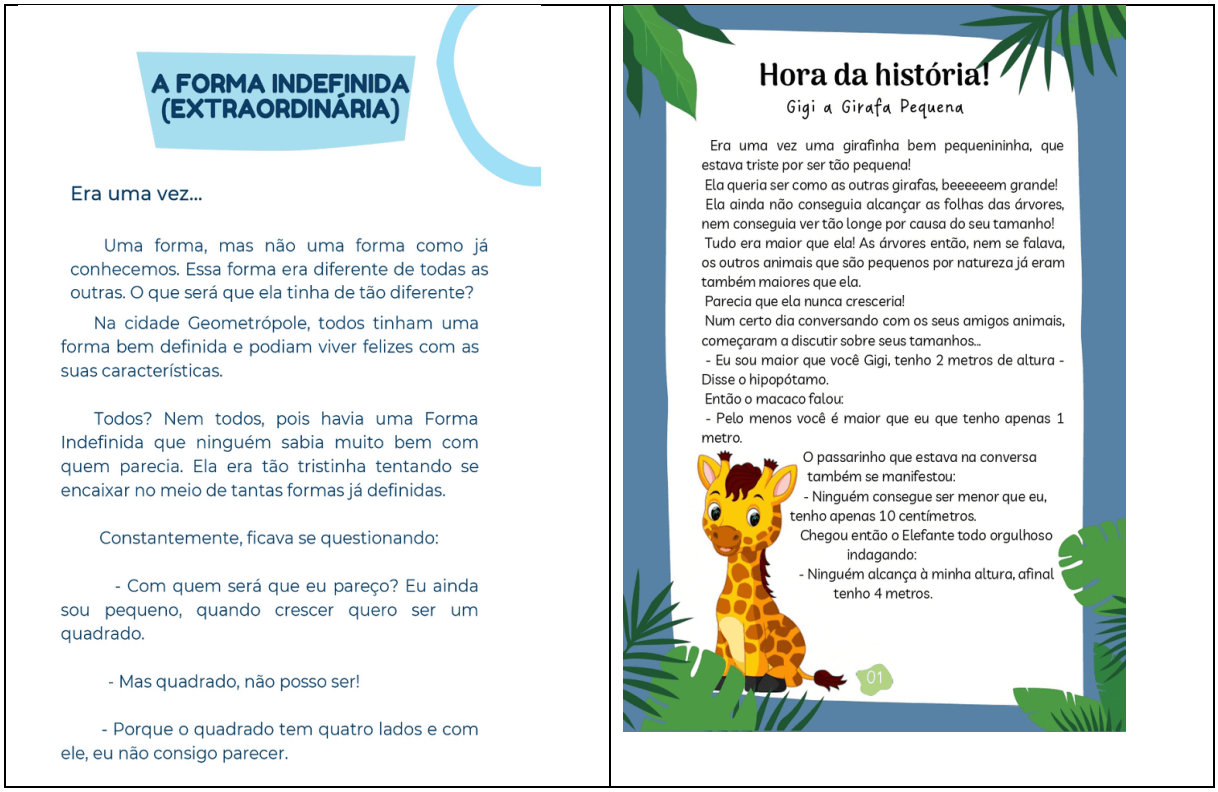
The studies outlined above, in common, propose that using children's literature makes it possible to express feelings, demonstrate actions, critically analyze and explain opinions. Therefore, based on these teachings, Children's Literature can certainly be linked to the teaching of Mathematics and, of course, to the teaching of science.

According to Ferro, Arrais and Moraes (2021, p. 112, our translation) “through stories we can create problematic situations that mobilize children to interact with the characters and seek, together with them, typically human solutions.” Reading circles allow for these interactions and participation in what is being read. Comments and suggestions must be considered so that the teacher can observe the children's knowledge and get to know them more and more. Above all, ideas and speeches produced by children as a result of the lives and actions

of the characters are rich in imagination and creativity. The simple act of motivating people to talk and share what they live and/or have experienced at some point in their lives can provide possibilities for use in the classroom.

Below is an example showing two excerpts from the stories created in the subject 'The Child and Mathematical Language'.

Figure 1 – Example of Material linking Children's literature and Mathematics teaching



Source: Authors' archive

The use of children's stories sharpens children's curiosity for what lies ahead. When listening to the narrative, they imagine every detail, character and continuity of the story. In books with images, there is observation and reflection on what they are seeing, associating it with what they are hearing. In this way, Smole (2014) considers children's literature as a significant playful device for children's thinking regarding mathematical notions, qualifying the work involving mathematical education in Early Childhood Education.

The production of this material proved to be, at first, quite challenging, as it was necessary for the students to exert tension based on the need to create and constitute a pedagogical proposal for children in Early Childhood Education and Early Years, and due to

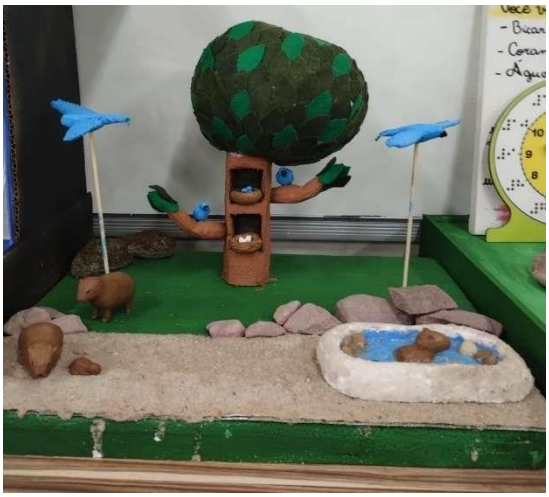
the insurgency of working with something, which until that moment was not noticeable, that is, mathematics and children's literature. However, during the production of the material and in classroom debates, several students showed interest in the topic, so that various materials can be used by teachers and children, since in this activity didactic scripts were created with a view to the development of the action.

It is worth mentioning that the practical activities, mainly in the context of the subjects 'The child, nature and society' and 'Content and Methodology of Science Teaching' were developed in the context of the Science and Mathematics Laboratory (LACEM), coordinated at this time by one of the authors.

Within the scope of the Science Teaching Content and Methodology discipline, we sought to develop teaching materials in quantities that would correspond to their use in schools and to be available at LACEM. The laboratory materials are, to a large extent, used in the development of activities linked to students' responsibilities in the course's mandatory internships, as well as for other actions. Therefore, its use is offered openly as a loan and made available to the academic community.

For this reason, there was a considerable group of students who chose to develop their mandatory internship courses in the Science curricular component due to the development and production of materials carried out during the discipline. The choice was not made due to the ease of the material already being produced, but because the students had produced manipulable materials thinking about the Amazon Region, specifically, in the State of Amazonas.

Figure 2 - Portrait of the Amazon environment



Source: Authors' archive

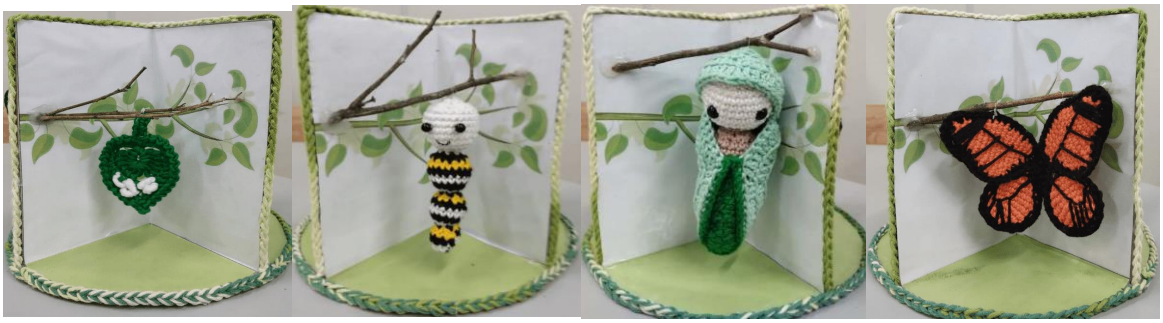
The materials were organized taking into account the Amazonian contexts, the experiences and affects of the students enrolled in the subject 'Content and Methodology of Science Teaching', focusing on the place in which they speak, move, experience, as can be seen in the Figure 03, focusing on the space of some animals in the middle of a forest.

The materials covered content linked to the functionality of the Brazilian Amazon Forest, such as: erosion of natural soils and under the influence of human action; perception of the density of the waters of the rivers that originate and pass through the region; types of soil for planting in the Amazonian context of Manaus; Evolution of plants in the region; Ores and Minerals from the Brazilian Amazon Region and Amazonian culture and identity.

In the production of these materials, the classes articulated learning themes within the scope of Early Childhood Education, seeking to develop manipulable objects that could be used in different classes/ages. In the case of the life and evolution of animals, one group chose to work with Butterfly, taking into account the types of butterflies in the Amazon region.

To do this, they produced four rotating faces using crochet. Each face represented a stage in the butterfly's development. Added to this, books of children's literature were produced that linked the environment, nature and society to boost the learning process of children between 1 and 5 years of age, enrolled in Early Childhood Education.

Figure 3 - Butterfly development



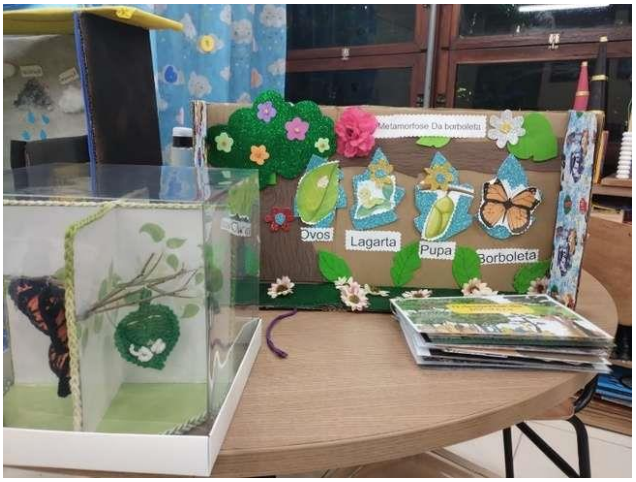
Source: Authors' archive

The children's literature book produced by Pedagogy students from the 8th period linked to the subject 'Content and Methodology of Science Teaching', was organized in such a way that children in the Initial Years of Elementary School could handle and remove the images, read information about a respective animal and understand interesting facts about its life, feeding methods, reproduction and importance in the ecosystem.

All figures used Velcro to fix the image of the animals and, at the same time, facilitate their removal from the book. This book format expanded the discussion about animal life,

especially in the Amazonian context, taking into account the region's animals, in addition to being inclusive in its use. To this end, the manipulable materials sought to continue a topic of debate and, at the same time, expand the discussion to new tensions.

Figure 4 – Portrait of materials developed at LACEM



Source: Authors' archive

The students demonstrated during the production of the materials, as well as in their application via practical activity in the classroom context, the theoretical-practical deepening not only of the discussions that permeate Science in the context of initial training, but also in the perception of objects of knowledge as an element that moves between knowledge and the place that this knowledge occupies in the production of the identities of subjects inserted in the school context (teachers-students-local community-family).

In all school periods there is a consensus that the production of manipulable teaching materials is necessary to achieve the objective of initial training, that is, to expose conditions and examples of activities that can be worked on with children, sometimes in Early Childhood Education, sometimes in Early Years.

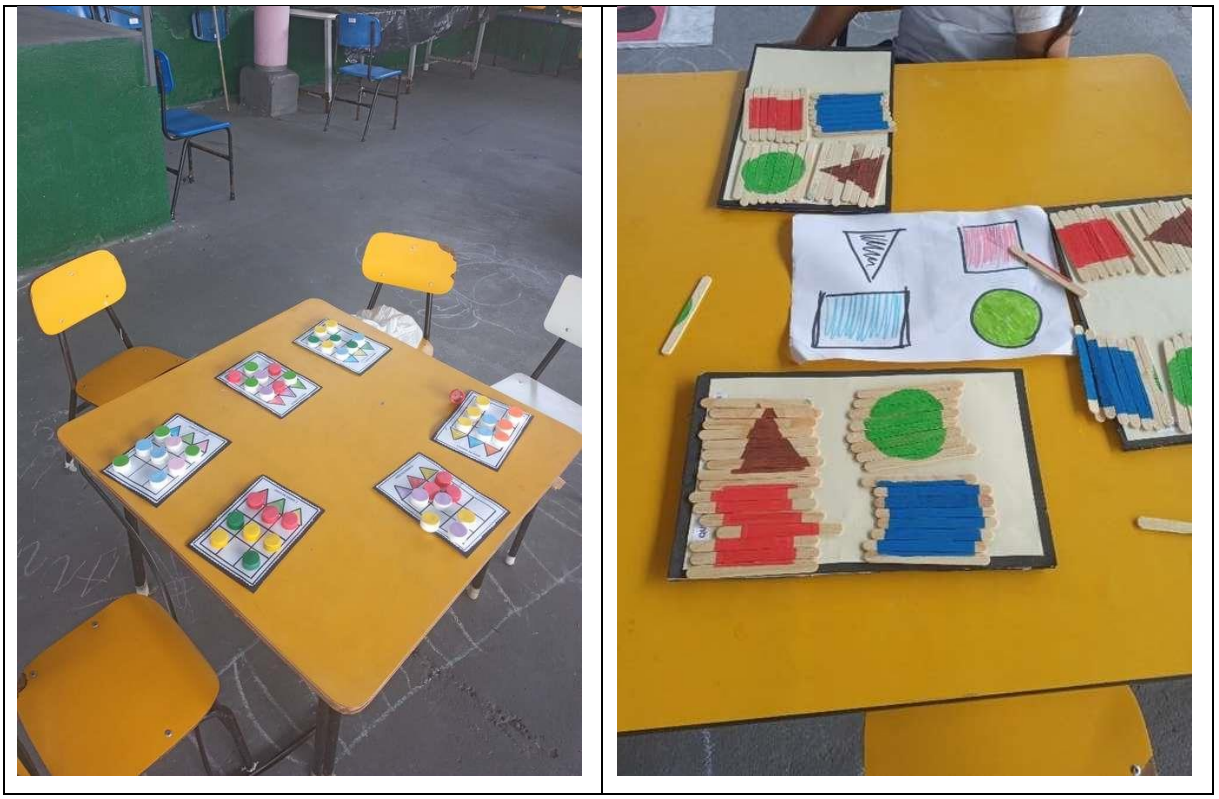
This maximum condition is implemented through different perspectives throughout the academic semesters, especially due to the concern of providing future teachers with the challenges and possibilities of working with the themes in question. One of these activities was carried out at a Municipal Early Childhood Education Center (CMEI) in the city of Manaus.

On this occasion, considering the subject 'Children and Mathematical Language', after reading and discussing three books, we moved on to the practical context. The books in question are: Early Childhood Education and Mathematical Perception by Sergio Lorenzato;

Mathematics in Early Childhood Education by Kátia CS Smole and The Child and Number by Constance Kamii. The practical activity was linked to an extension project entitled 'Mathematical Explorations, Playfulness and Early Childhood Education: challenges and possibilities from Mathematics Education' coordinated by one of the authors who signed this article.

The activities at CMEI take place at certain moments, with the first moment being destined to go to the school in order to recognize its location; check room spaces; get to know the class teachers and the places where the activities could be carried out.

Figure 5 – Playful Activities carried out at CMEI



Source: Authors' archive

The materials were produced with financial resources from the extension project promoted by the Pro-Rector of Extension (PROEXT) of the Federal University of Amazonas. After the activities, the materials were donated to CMEI, as the teachers were interested and we understood that in that space their use would be carried out in a playful and everyday way. The proposal proved to be timely, considering that some students until that moment had not had the opportunity to be and talk to children in Early Childhood Education.

What we have been stressing with students on the Pedagogy course is that the perception, manipulation and production of teaching materials in the classroom context does not take place outside the debate about the students' knowledge, their place of speech, their affects and circularities. Look at what you already know, produce from this context experiences that formulate new ways of being and perceiving the world.

Didactic-pedagogical materials do not produce significant learning by themselves. To this end, these future teachers must address, in the process of discussion and presentation of objects and themes of knowledge, tensions that make sense, that represent the movement of their students in the teaching and learning process, therefore, "explore what the word experience allows us to think, what the word experience allows us to say, and what the word experience allows us to do in the pedagogical field " (Larrosa, 2015, p. 38, our translation).

Teaching materials are not the end, but possibilities for new experiences, new ways of looking at formal education and its formative narratives through bringing together what one wants to learn, what one knows and the production of different ways of being in the context to which we (students and teachers) are inserted.

Provisional considerations

We seek to discuss the intertwinings that have moved us in the process of training new teachers within the scope of the Pedagogy course. We seek to think about how we have acted based on Larrosa's (2015) concept of experience, to what extent students have or have not approached the training process, beyond the theoretical discussions that constitute the academic sphere.

What we observed is that as we bring the reality of these students' lives closer, not only to the classroom context, but to the social and cultural ways in which they are inserted, these students are affected by the nuances that move towards teaching, through tensions, approximations with their ways of being, about what they know and how they know about their region.

Producing teaching materials, from literature books, models of different formats and teaching sequences in laboratory and classroom contexts, proved to be fluid in the context of initial training in Pedagogy. Producing, not just the material, but understanding how to take production to the teaching and learning process has demonstrated that teaching does not refer to the presentation of one or another area of study, but the concerns that can be produced by students, as well as well as by teachers in the classroom context.

Acting within their regional contexts, looking at the cultures that foster their ways of being, were constant narratives in the pedagogical diaries. This helped us to think about the models, procedures and instruments used during the development of these curricular components, seeking to learn about the region, the social, political and cultural narratives that organize the ways of being of the students in training.

Thus, we experience and move through the teaching process, seeking to learn with, about and from the elements that constitute not only teaching, but our identities, thus becoming subjects of experience.

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