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DEVELOPMENT OF A TASTE FOR POETRY AND MATHEMATICS IN 5-YEAR-OLD CHILDREN – CONTRIBUTIONS FROM AN ARTICULATION PROJECT

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ABSTRACT

A qualitative study was developed that focuses on the articulation between literary, linguistic and mathematical education through poetry. One of its objectives is to promote the development of a taste for mathematics and poetry. There is a close relationship between motivation and learning, which is why it is important to invest in developing a taste for mathematics and poetry since childhood.

An outline of the study is presented, focusing on its development with 5-year-old children in the context of early childhood education, over the course of six months. From the mobilization of poems with literary quality and potential to promote the articulation of the aforementioned areas, learning paths were constructed and developed in context.

The analysis of the data resulting from the research indicates that the articulation strategies implemented actually contributed to fostering children's taste for poetry and mathematics.

KEYWORDS: Articulated construction of knowledge, linguistic education in preschool education, literary education in early childhood, elementary mathematics education, poetry in childhood.

DESENVOLVIMENTO DO GOSTO PELA POESIA E PELA MATEMÁTICA EM CRIANÇAS DE 5 ANOS – CONTRIBUTOS DE UM PROJETO DE ARTICULAÇÃO

RESUMO

Desenvolveu-se um estudo qualitativo que se centra na articulação entre educação literária, linguística e matemática através da poesia e que tem como um dos seus objetivos promover o desenvolvimento do gosto pela matemática e pela poesia. Existe uma estreita relação entre a motivação e a aprendizagem, pelo que é relevante o investimento no desenvolvimento do gosto pela matemática e pela poesia, desde a infância.

Apresenta-se um recorte do estudo, focado no desenvolvimento do mesmo com crianças de 5 anos em contexto de educação pré-escolar, ao longo de seis meses. A partir da mobilização de poemas de qualidade literária e com potencialidade para promover a articulação das áreas referidas, foram construídos e desenvolvidos em contexto percursos de aprendizagem.

A análise dos dados resultantes da investigação aponta para que as estratégias de articulação implementadas tenham, de facto, contribuído para fomentar o gosto das crianças pela poesia e pela matemática.

PALAVRAS-CHAVE: Construção articulada do saber, educação linguística em educação pré-escolar, educação literária emergente, educação matemática elementar, poesia na infância.

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1. INTRODUCTION

With the aim of *characterizing, understanding and transposing to praxis knowledge about the articulation between poetry and mathematics that foster the taste for both areas and contribute to the development of linguistic, literary and mathematical skills in Preschool Education,* a qualitative study was developed, with characteristics of action-research. In this article, the focus is placed on the presentation of the results of the answer to the research question: *To what extent can the development of activities of articulation between poetry and mathematics contribute to foster the taste for both?*

This dimension of the taste for poetry and mathematics is highly relevant, insofar as several studies have shown, interest and motivation are strongly related to learning (Tapia & Fita, 2015). Particularly with regard to mathematics, which is traditionally seen by society as something difficult and unpleasant (Viana et *al.*, 2023), it is important that children have positive and motivating contact with it from childhood.

The role of poetry, which, in the case of the present study, may seem to emerge as a motivating context in which mathematics can be framed, goes far beyond what has been mentioned. The investigation was conceived so that poetry is valued for its own sake and not just used as a means to achieve a pedagogical purpose (Fonseca, 2020).

Over three research cycles, about 21 learning paths were built and developed based on poems and involving the articulation of the f literary, linguistic and mathematics education areas. Although the study was carried out with two groups of children, aged 4 and 5, in the article we focus particularly on the group of 5-year-olds.

For the analysis, interviews conducted at various moments of the research with educators and children were considered, as well as data resulting from direct and participant observation of the researcher throughout the sessions of development of the learning paths and reflection on them (Latorre, 2008).

Aiming to contribute to the expansion of scientific knowledge, we present some considerations about the contributions of the aforementioned articulation to the development of the taste for poetry and mathematics, in the context of Preschool Education, with 5-year-old children.

2. THEORETICAL FRAMEWORK

The articulation of areas of knowledge makes sense, especially in the context of Preschool Education, due to the holistic way in which children develop their learning (Silva, et *al.*, 2016). The articulation between literary, linguistic and mathematics education has been the subject of some studies, mainly at an international level. For example, studies have shown that both mathematics and reading imply the understanding of a symbolic code, made up of letters or numbers (Collins & Laski, 2018). There are even studies that, among the benefits of mobilizing children's literature in the approach to mathematics education, present an increased interest in mathematics and the development of motivation for mathematical thinking (Maričić, Stakić and Malinović-Jovanović, 2017). In addition to this we see the improvement of mathematical performance and greater

involvement in mathematical discourse (Monroe et *al*., 2018). However, most of the existing studies do not focus specifically on poetry, nor on Preschool Education.

By addressing particularly, the dimension of the taste for poetry and mathematics, it is important to keep in mind how motivation relates to learning, which is why it should be promoted. The learning context can be an activator of children's motivation and interest in learning, to the extent that it dialogues with their own characteristics and, therefore, acquires meaning for them (Tapia & Fita, 2015). Playing also occupies a prominent place in this context, as, by naturally promoting learning, it is important that it occupies a central place in pedagogical practice (Soares, Côco & Ventorim, 2016).

Thus, the role of the learning mediator, as the person responsible for deciding the activities to be carried out and how they can motivate children, is fundamental (Tapia & Fita, 2015). It should be noted that studies indicate that the beliefs that children develop in the early years about their mathematical abilities have an influence on the way they will view this area of knowledge in the following years and, as such, on the success they will have in it (Altieri, 2005). In fact, in the context of mathematics education (ME) it is important that the mediator acts in such a way as to bring children closer to the mathematical experience in everyday life (Viana et *al*., 2023).

Also in the area of linguistic and literary education (LLE), the mediator, by acting intentionally, leads the child in the development of the first conceptions about reading (Macedo & Soeiro, 2009; Pereira & Alencar, 2017). In the specific case of poetry, by enhancing regular and pleasurable contact with it, it will allow it to become more familiar and accessible, as well as the "literary language" itself (Siméon, 2015, p.85).

In this context, we highlight the affective dimension that involves and characterizes poetry. This can enhance the creation of an affective relationship with the literary text, thus contributing to the development of literary skills, including the ability to read and interpret the world (Azevedo & Melo, 2012).

The article reflects separately on the different poetic typologies playful, lyrical and narrative (Cervera, 1992) and visual (Hatherly, 1975; Bernardino, 2016), trying to establish a relationship with the children's appreciation of each one of them.

The mathematical components evident in the Curriculum Guidelines for Preschool Education are also analyzed in detail, *Geometry and measure*, *Numbers and Operations, Organization and Data Processing* and *Interest and Curiosity for Mathematics* (Silva et *al*., 2016).

3. METHODOLOGY

One of the aims of the study in which this article is a part of is to understand *to what extent the development of activities of articulation between poetry and mathematics can contribute to foster the taste for both*. Thus, although two groups of children, aged 4 and 5 years and their educators, participated in the empirical component of the research, in the article we focus on the 5-year-old group, consisting of 12 children and accompanied by two educators.

The study, with characteristics of action-research (Latorre, 2008), was developed in the context of Preschool Education over six months, between January and July 2023. During this period, three research cycles (RC) took place. Each RC was composed of between four and six

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learning paths (LP), sequences of activities in which the LLE and the ME were articulated based on a poem or occasionally a poetic book or meetings about poetry [one of the LP's consisted of the preparation and the visit of grandparents who shared and listened to poems; another consisted of the preparation and the meeting with the poet João Manuel Ribeiro]. Each LP presented had between one and four 45 to 60 minutes sessions.

The poems addressed in the LP's were selected from a *textual corpus*, previously constituted, in one of the first phases of the study. Approximately 100 poems were gathered that met criteria of literary quality and showed potential in terms of articulation between LLE and ME.

It should be noted that the selection of poems and the planning of the LP's were carried out throughout the project taking into account the interests and needs of the children (Folque, 2014), articulating the contributions of children, educators, researchers and specialists from both areas involved.

Table 1 shows the central elements of the various LP's carried outd.

Table 1: Presentation of the central elements of the LP's

RC	Poema/ Elemento central do LP	Poetic typology	Key Mathematical Components of the LP
1st	*Convite (Invitation)* – José Paulo Paes (1989)	Lyric	*Geometry and measurement* *Numbers and operations*
	Contas de Somar (Adding sums) – João Manuel Ribeiro (2011)	Playful	*Numbers and operations*
	Copo copo jericopo (Glass glass jeriglass) – collection by Teresa Guedes (2000)	Playful	*Numbers and operations*
	O Tigre (The Tiger) – António Manuel Couto Viana (2008)	Playful	*Numbers and operations*
2nd	*A minha galinha pinta (My speckled chicken)* – collection by Alice Vieira (1994)	Playful	*Numbers and operations*
	Segredo (Secret) – Miguel Torga (1956)	Narrative	*Geometry and measurement* *Organization and processing of data*
	O Ovo e *Ovo (The Egg* and *Egg)* – João Pedro Mésseder (1999; 2016)	Lyric	*Geometry and measurement*
	OVO AVE VOO VOA (EGG BIRD FLIGHT FLY) – Abílio-José Santos (1968)	Visual	*Geometry and measurement* *Organization and processing of data*
	Book *Versos com reversos (Verses with Reverses)* – João Pedro Mésseder (1999)	---	---
	POETRY WITH GRANDPARENTS	---	---
3rd	*Eu, tu (Me, you)* – João Manuel Ribeiro (2009)	Playful	*Numbers and operations*
	Fresquinho, freguês (Fresh, customer) – Nuno Higino (2008)	Narrative	*Organization and processing of data* *Numbers and operations*
	O rei dos trocadilhos (The King of Puns) – José Jorge Letria (1992)	Narrative	*Geometry and measurement*
	Ladrão (Thief) – João Manuel Ribeiro (2009)	Narrative	---
	MEETING WITH THE POET	---	---

	Eucalipto (Eucalyptus) – João Pedro Mésseder and Francisco Duarte Mangas (2002)	Visual	*Geometry and measurement*

As an example, we present one of the LP's developed, based on the poem *Eu, tu*, Ribeiro (2009).

Eu, tu (Me, you)

Sola	*sapato*	*(Sole shoe)*
Rei	*rainha*	(*King queen)*
Galo	*pato*	(*Rooster duck)*
Carapau	*sardinha*	(*Horse mackerel sardine)*
Mão	*luva*	(*Hand glove)*
Dedo	*pé*	(*Finger foot)*
Vinho	*uva*	(*Wine grape)*
Água	*café*	(*Water coffee)*
Menino	*menina*	(*Boy girl)*
Vestido	*nu*	(*Dressed naked)*
Cravo	*bonina*	(*Clove bonina)*
Eu	*tu.*	*(Me you.)*

In addition to promoting the taste for poetry and mathematics, development and learning objectives were outlined. Within the scope of the LLE, to promote the development: of the notion of poetry; reading and writing skills (writing orientation, familiarity with the written code, phonic-graphic correspondence); of phonological consciousness. With regard to ME, to promote the development: of the sense of number; the notion of ordinality; the notion of ascending and descending order and the notion of addition.

In this sense, the LP had three 45 minutes sessions, in which activities were developed such as:

- Look for the verses numbered in the order in which they appear in the poem, in the woods of the kindergarten;
- Sort the verses and read the poem (reading images);
- Explore the relationships between the words that make up the poem;
- Create, in a large group, a poem based on the poem *Eu, tu*, paying attention, for example, to criteria such as words with the same number of letters;
- Search for words in the poem with specific vowels;
- Reading (Unconventional) and recitation of the poems.

More detailed examples of LP's can be found in Pereira, Palhares & Azevedo (2024).

In order to understand the contribution of the articulation between LLE and ME, through poetry to the development of the taste for poetry and mathematics, the intervention in the context of Preschool Education was complemented with the collection and analysis of data.

The observation, conversation and analysis of documents were fundamental as data collection techniques characteristic of action-research (Latorre, 2008; Coutinho, 2013). Instruments such as the field diary, containing the researcher's notes, audio and image recordings,

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children's productions and interviews with educators and children, carried out at the various moments of the study, are presented in Table 2:

Table 2: Presentation of the interviews conducted

RC	Participants	Beginning of the cycle	End of the cycle	Interview		
				Individual	Pairs	Small group
1st	Educators	x	-	x	-	-
		-	x	-	x	-
	Children	-	x	-	-	x
2nd	Educators	-	x	-	x	-
	Children	-	-	-	-	-
3rd	Educators	-	x	x	-	-
	Children	-	x	-	-	x

A semi-structured interview model was chosen for the educators (Amado & Ferreira, 2014). They addressed some topics, which will be focused on in this article: *children's interest in the project*, *children's interest in poetry* and *children's interest in mathematics.*

The interviews with the children were carried out through oral questioning by the researcher, and by graphic (Figure 1 [pasting a sticker]) and oral responses by the children. In order to feel more motivated and involved in the interview, the children could select the sticker that best expressed their answer and stick it on the circumference corresponding to what they wanted to express [large – yes / very much; medium – more or less; small – no / little]. At the same time, they were invited to answer or explain the reason for their answer orally.

Figure 1: Child answering the interview

In addition to the interviews, several large group dialogue sessions were held with the children. Right at the beginning of the project, in order to understand their perceptions of poetry and mathematics and then at the end of each RC. In these reflection sessions, the poems addressed during the respective RC were remembered and the children were invited to vote for the poems they had liked more or less. In addition to data collection, these moments allowed the children to get involved in the reflection phase and to develop data *organization and processing skills* (Silva, et *al*., 2016).

In view of the diversity of data collection instruments mobilized, their triangulation was crucial to establish some considerations on the subject in question (Latorre, 2008). Thus, reflection reports were written at the end of each RC enhancing the cyclical process of research, action and

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critical reflection with a view to improving practice and the context (Tinoca, 2017; Coutinho et *al*., 2009).

The analysis of the data regarding the development of the taste for poetry and mathematics, in the case of quantitative data, was carried out through descriptive statistics (Amado et *al.*, 2014). With regard to the qualitative data, it was carried out through an analysis by categories, adopting some characteristics of content analysis (Esteves, 2006).

In this sense, it is important to note that the categorization took place to the extent that it allowed to classify and reduce the data, reconfiguring them according to the objectives of the research. The categories emerged mainly from the data, so open procedures were used in their formulation. In this stage, we sought to comply with the principles of mutual exclusion, homogeneity, exhaustiveness, pertinence, productivity and objectivity. Subsequently, in the inference production phase, the results were interpreted (Esteves, 2006).

It should also be noted that the project was presented to the Ethics Committee for Research in Social Sciences and Humanities of the University of Minho, which granted it a favorable opinion. Although the kindergarten had authorized the public mention of its name, throughout the development of the project, the guarantee of the children's right to confidentiality was safeguarded, maintaining their privacy and personal data, mentioning them in a coded form (Baptista, 2014). Furthermore, the informed consent of the children, parents and educators was ensured.

4. PRESENTATION AND ANALYSIS OF DATA

4.1. Interest for the project

The interest that the children showed in the project reflects, in some way, their interest in the areas involved, thus making it pertinent to analyze it.

Both in the interview conducted at the end of the 1st RC and in the interview at the end of the 3rd RC, all the children stated that they had enjoyed playing with poetry and mathematics, in response to one of the questions. Likewise, in the interview at the end of the 3rd RC, when asked the question: "Would you like the project to continue?", all the children said yes.

The data resulting from listening to the educators through the interviews carried out during the ICs corroborate the children's appreciation of the project, as shown in Table 3:

Table 3: Analysis of the topic *Interest in the project* in the interviews with educators

Code	Descriptors	Indicators
	1st RC	
1A	- In moments of spontaneous play, children talk, play and replicate the activities carried out in the sessions;	2
	2nd RC	
2A	- Children continue the activities carried out in their day-to-day lives spontaneously;	1
	3rd RC	
3A	- A positive evolution of children's interest is observed;	1
3B	- The children expressed a constant/continuous interest;	4

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3C	- The children were anxiously waiting for the arrival of the researcher;	1
3D	- Association of interest in the project with the diversity of activities;	1

The data presented in table 3 indicate that:

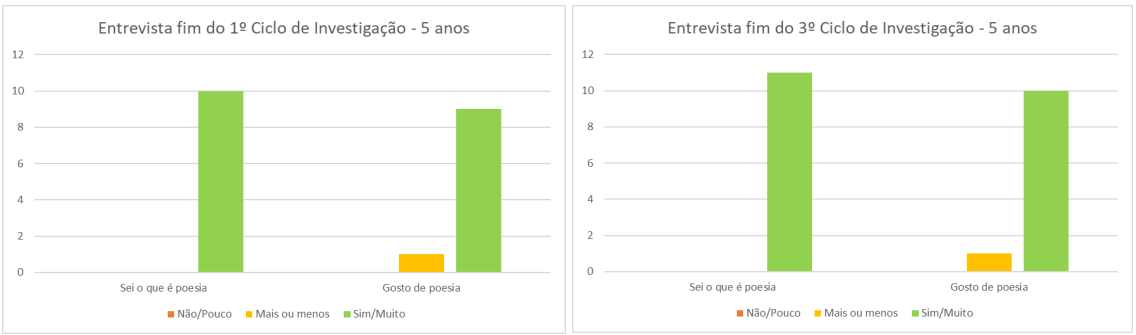
- Children show a high interest in the project ([indicator codes] 3A-1, 3B-4);
- The children spontaneously mobilize content and activities carried out in the project sessions for their day-to-day life (1A-2, 2A-1);
- The children relate the mediator to the project in a positive way (3C-1);
- The activities carried out influenced the children's interest in the project (3D-1).

Complementing the analysis presented with data resulting from the researcher's direct and participant observation (Latorre, 2008), it is important to highlight the way in which they are concordant. The children's verbal expressions, such as, "it's very cool" (*CG),* their body expressions and attitude of curiosity and enthusiasm during the sessions indicate a high interest in the project.

4.2. Development of the taste for poetry

Considering poetry in particular, it is important to know the notion that children have of it, in order to better understand its influence on the interest and taste for poetry. Thus, the first interview took place only at the end of the 1st RC (Graph 1), when the children had already come into contact with some poems and reflected on some characteristics of the literary genre. The interview was repeated at the end of the 3rd RC (Graph 2).

Graphs 1 and 2: Analysis of the interviews with the 5-year-old group: group of poetry questions



When analyzing the graphs in conjunction with the individual analysis of the interviews, we observe that:

- All the children stated that they knew what poetry is, since the end of the first RC;
- The vast majority of children stated that they liked poetry very much (at the end of the 1st RC, 88,89%, and at the end of the 3rd RC, 90%);
- *JP,* who had said he liked poetry "more or less", at the end of the project said he liked it a lot;
- *TA,* who at the end of the 1st RC had said he liked poetry a lot, in the end said he liked it "more or less". However, his attitude of interest in all activities, and even what he said throughout the final interview, demonstrates the positive impact that the project had on him, having even said that he would like the project to continue "Yes, even in my primary school"; "If you got sick, I would go to your house and wake you up."

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In the interview conducted at the end of the 1st RC, the answers of the children who wanted to define poetry were:

Table 4: Analysis of the answers to the question "What is poetry?" – end of the 1st RC

Code	Topic	No. of children	Examples
4A	Playing with words	10	"poetry is playing with words" (*AN*) "is to play with words" (*AT),* (*BG),* (*CG),* (*JP),* (*LC),* (*MS),* (*MG),* (*ML*), (*MT*)
4B	Talk a lot	1	"it's talking a lot" (*JP*)

Answer 4A is given by most children. We understand that this is due to the way they had the opportunity to experience and internalize the notion of poetry transmitted in the first poem addressed within the scope of the project*, Convite [Invitation]* (Paes, 1989).

Regarding the question regarding the taste for poetry:

Table 5: Analysis of the answers to the question "Do I like poetry? Why?" - end of the 1st RC

Code	Topic	No. of children	Examples
5A	Associates with specific poems	2	"I like the "poem of the tigers" (*AN)* "I liked the poem of the tigers" (*MT*)
5B	Associates with specific activities	5	"I liked it when you played that tiger game outside... and also that of the cups" (*AT)* "more because the tigers' game was very cool" (*JP*) "because you played the tiger game outside and the "jericopo cup" (*MG)* "I like it because you let me draw sometimes" (*ML)* "I like to work with you and I like to go outside with you" (*CG*)
5C	Highlights the appreciation of the literary genre (does not justify)	2	“Eu adoro poesia” (*AT*) “Eu adoro poesia” (*LC*)
5D	Associates with the mediator	6	"because I like to do work with *R* [researcher] and I like to learn from *R*" (*BG)* "I like to do work with you and I like to go outside with you" (*CG*) "I like to learn from *R* and I like to be with *R*" (*LC)* "I like to learn new poems from R" (*MS)* "because I like to learn from you" (*ML)* "I like to learn from *R*" (*MT*)
5E	Associates with learning	4	"because I like to do work with *R* and I like to learn from *R*" (*BG*) "I like to learn from *R* and I like to be with *R*" (*LC)* "because I like to learn from you" (*ML)* "I like to learn new poems from R" (*MS)*

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In the analysis of the answers given by the children who chose to explain the reason for liking poetry, the predominance of the association with the mediator (5D-6) is found, which confirms the relevance of the role that reading mediation has in the development of interest and taste for reading (Macedo & Soeiro, 2009). This is followed by the association of the taste for poetry with specific activities carried out in the approach to poems (5B-5), which highlights the importance of careful planning of them (Tapia & Fita, 2015).

The association with learning is also frequent (5E-4), a result that shows the way children understand poetry as a window of learning.

There are also children who justify their taste for poetry with the fact that they have appreciated a specific poem (5A-2) and others who, not justifying it, highlight their great appreciation of the literary genre (5C-2).

In the interview at the end of the 3rd RC, more emphasis was given to the second part of the questions, which had not been asked in the first interview, so there were only four children who spontaneously wanted to justify their answers, saying that poetry "is playing with words" (*AN),* (*AT*), (*BG),* (*LA).*

Throughout the various interviews, the educators stated that the children's interest in poetry was visible. They attributed this interest to:

- the rapid learning of children, saying that:
  "they caught it very well and created a very great interest, when the poetry of the planets was made, they quickly caught it, because they are being worked on, so it is noticeable that work has been put into it making them interested in poetry" (Educator C);
- the fact that they show the desire to share poetry and their learning, visible in: "at home, they talk to their parents, and tell and say" (Educator C);
- articulating poetry with everyday life, as can be seen in:
  "In everyday life it is also noticeable, even at the level of awareness of the word and the sounds themselves, they now try much more to refer, X word rhymes with another, this sound is the same as that of..." (Educator D).

Regarding the activities that they considered to have the most impact on the development of the taste for poetry, although they considered that all activities contributed to this, they highlighted the activities presented in Table 6:

Table 6: Analysis of the interviews with educators: activities with the greatest impact on the taste for poetry

Activity	Descriptors	Justification
Poetry Session *with grandparents*	The poetry session with the grandparents allowed us to relate previous learning in a meaningful way;	"I think the activity with the grandparents was the culmination of them all. Perhaps it had more impact because it related everything that was done in a single moment" (Educator D)
	The children showed a willingness to share their learning with their grandparents;	"the fact that the grandparents came here, I thought it was phenomenal, the interest of the grandparents and the willingness they showed to tell their grandparents what they learned" (Educator C)
	The children demonstrated that they had developed the	"that of grandparents, because they realize that the work that is being done can be taken to the real world

	perception that activities around poetry have a relationship with the real world.	and they realize that what they are learning they are going to share, that there is a whole environment around them" (Educator D)
Session *Meeting with the poet*	The children showed that they really liked the visit of the author João Manuel Ribeiro, for the way he interacted with them;	"the poet's arrival was spectacular, because of the way he was also very cheerful, very spontaneous, very focused on them, and they loved it" (Educator C) "[They talked] Very much about it, a lot about it. And they played and changed their tone of voice according to the teacher [poet], they sang, although the teacher had that very strong voice, and they sang, but they imitated him like that with a very deep voice. I thought that this was an added value" (Educator C)
	The children developed the perception that what they learned in kindergarten (as part of the project) has a relationship with the real world.	"The writer's approach makes brings the real world to them, because they realize that it's okay, that there is a book, there is a writer, there is a poet, with whom they contacted, from whom they learned different things, but I think it is different for them and has an impact, which is what I felt happened, of them seeing the person who wrote that in front of them and realizing "no, that person is real, it was this person who wrote what I liked to read, what I liked to hear" and I think that had a lot of impact on them" (Educator D)
Book exploration session *Versos com reversos*	The children showed that they value the free exploration of the book and its manipulation.	"For example, that activity in which they were able to leaf through the book, I think it also had a different meaning" (Educator D)
LP motivated by the poem *OVO AVE VOO VOA*	The children showed that they enjoyed the activity of deconstructing words.	"the one with the "egg" also had a lot of meaning for them, but there it is, it's different, they deconstruct the word" (Educator D)
LP motivated by the poem O Ovo	The children showed that they appreciated the activity of poetic creation.	"I think when they made the fish" (Educator C)
LP motivated by the poem *Eu, tu*	The learning path motivated by the poem *Eu, tu* had a great impact on the children.	"the one that I may identify as having the most impact, due to the construction of the activity and also the impact it had on them was that of "tu eu" [Eu, tu]" (Educator D)
LP motivated by the poem *Fresquinho freguês*	The children showed a lot of interest in the activity of fishing for words with specific characteristics.	"Well, the fish one I thought was spectacular" (Educator C) "when they fished, it showed that they were very interested and eager to learn things and to tell and to do and interact with each other" (Educator C)

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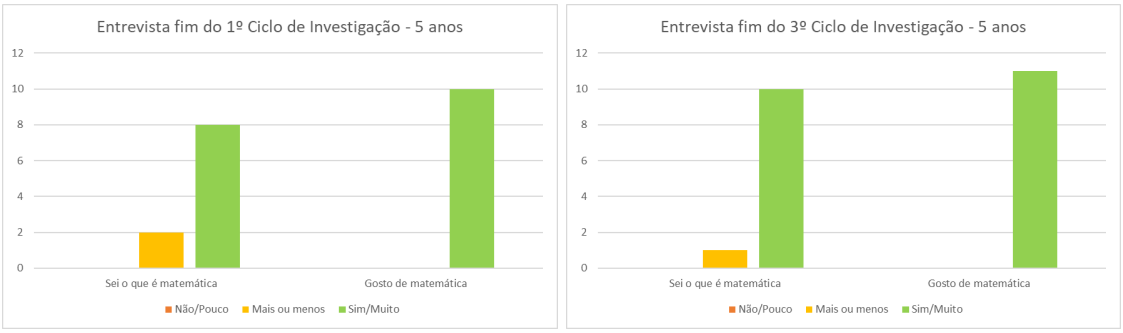
Analyzing the activities highlighted by the educators, we observe that the children showed a great interest in those who had the word as the central element, since they could interact with it, find it, construct it or deconstruct it. Also noteworthy are the activities that involved the community, mainly due to the perception of the connection between poetry, kindergarten and the outside world.

4.3. Development of the taste for mathematics

Mathematics emerged in the project and in each learning path in a contextualized form, even though sometimes there was no explicit reference to it. In fact, although the children often associated notions covered in the sessions with mathematical notions, it is very likely that this did not always occur. Thus, and given that in the institution there is a very systematic work of mathematics, developed by the educators, it is possible that the children's answers are not only due to the notion of mathematics that they acquired through the project, but also in the entire experience in kindergarten. Graphs 3 and 4 show the children's answers to the group of questions about mathematics, respectively at the end of the 1st RC and at the end of the 3rd RC:

Graphs 3 and 4: Analysis of the interviews with the 5-year-old group: group of mathematics questions



- At the end of the 1st RC, 80% of the children said they knew what mathematics is and at the end of the 3rd RC the value went to 90.91%, AT said he knew what mathematics is and only the AN maintained his answer;
- Both at the end of the 1st RC and at the end of the 3rd RC, 100% of the children said they liked mathematics very much.

In the interview conducted at the end of the 1st RC, the children who chose to explain what they understood mathematics to be gave the answers analyzed below:

Table 7: Analysis of the answers to the question "What is mathematics?" – 5-year-old group

Code	Topic	No. of children	Examples
7A	Associates with operations	3	"I know, sums are is maths, isn't it?" (*JP)* "mathematics is doing sums" (*LC*) "adding sums" (*MS*)
7B	Associates with being difficult	1	"it's a little difficult" (*AT)*

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Three of the children associated mathematics with operations (7A-3), although these are indeed associated, it is observed in the answers a reduced understanding of what mathematics is, only associated with the component *Numbers and operations*.

One of the children only expressed his perception instead of trying to find a definition (7B-1), however his comment shows some reluctance to this area, as he already considers it difficult. Note that this child normally responds or performs the tasks proposed in the field of mathematics very easily. Thus, the fact they associate mathematics with something difficult may relate to the fact that they have older siblings of school age who may influence their perception by making that kind of comment. This hypothesis is corroborated by the fact that the same child at the end of the 3rd RC associated it with the 1st cycle of basic education, saying "mathematics in primary school we do sums" (*AT*). He also associated mathematics with "graphics" (AT), carried out within the scope of the classroom routine and not the project.

In addition to this, at the end of the 3rd RC, only one other child chose to say what he understood by "mathematics". He associated it with games that involve numbers and involve being attentive so that they can learn, "we can make games, but we have to pay attention for us to learn things, like in numbers and so on" (*LA).* Although it is not possible to compare the general perception of the group, due to the fact that, both at the end of one RC and in the other, the number of answers is small. We observe a greater elaboration in the description of what mathematics involves, emerging at the end of the 3rd RC, the playful dimension that it can present.

With regard to the taste for mathematics, Table 8 presents the analysis of the justifications given by the children in the first interview, at the end of the 1st RC:

Table 8: Analysis of the answers to the question "Do I like mathematics? Why?" – end of the 1st RC

Code	Topic	No. of children	Examples
8A	Associates with enjoying doing operations	7	"because I like to do sums" (*LC)* "I also like to do sums" (*BG*) "it's really cool and I also really like to do sums and to do treasure hunts" (*JP*) "because I like to do adding sums" (*ML)* "I like the adding sums" (*AN*) "I like to do adding sums" (*CG)* "I like to do adding sums" (*MS*)
8B	Associates with the mediator	2	"I like mathematics because I like to do things with *R* [researcher]" (*MS)* "I like it because you teach things" (*MG)*
8C	Associates with specific activities	1	"it's really cool and I also really like to do sums and to do treasure hunts" (*JP*)

Most of the children in the group associate the taste for mathematics with the taste for doing operations (8A-7), four of them concretely associate addition operations (*ML*), (*AN),* (*CG*), (*MS).* The emphasis on the addition is probably due to the fact that this was the operation that was most used in the articulated approach to the poems. It should be noted that the use of the terminology "adding sums", instead of "additions", is due to the fact that this is actually a title of one of the poems addressed, *Contas de somar* de João Manuel Ribeiro (2011).

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We also observed that the children associate the taste for mathematics with the mediator (8B-2) and with specific activities (8C-1), which reinforces the importance of preparing and conducting the learning paths and approach of the poems.

At the end of the 3rd RC, other justifications for the taste for mathematics were already observed. It should be noted that in these, in addition to the *Numbers and operations* component, the *Geometry and measurement* component surfaces. In the justification, two children say "measure the head of the *AT* like this" (*AN*) and "it's because we can measure things, like this, measure this part here" (*BG*). Another child associates his love of mathematics with what he feels, saying "because it's very cool" (*AT*) and another to the fact that he likes to count “because it's fun, because I like to count" (*LA)*

Throughout the interviews, the educators highlighted the activities that they considered most to have contributed to the development of the taste for mathematics, as shown in Table 9. Furthermore, in the final interview, Educator D even stated that the fact that the approach to mathematics was carried out in a practical way and articulated with the context, contributing to the development of the taste for mathematics:

> "In relation to mathematics, I think that the everything, is really the whole (...) All the activities had a very practical context, there was no theoretical approach to anything, everything was related to what they were working on, with what they like and, and there it is, with their daily lives, so this impact was general and there was no break (...) it was good".

Table 9: Analysis of interviews with educators: activities with the greatest impact on the taste for mathematics

Activity	Descriptors	Justification
LP motivated by the poem *Eucalyptus*	Through the measurement activities with non-conventional units, the children were alert and motivated to measure, and they began to do it spontaneously in everyday situations.	"I know they had a ruler here not long ago (...) and they were measuring the chairs, their heads, their arms, the length of their fingers here with the ruler, so all of this is an asset for mathematics" (Educator C) "In terms of mathematics, the activity they did outside, which forced them to measure, to make that point of hugging the tree, of counting with their fingers in order to be able to measure, I think it also had a lot of impact" (Educator D)
LP motivated by the poem *Fresquinho freguês*	The children showed a lot of interest in the activity of fishing for words in the shape of fish and simulating their sale.	"when they fished, it showed that they were very interested and eager to learn things and to count and to do and interact with each other" (Educator C)

The educators highlighted activities that involved the experience of mathematical concepts and their articulation with everyday situations.

4.4. Interest for the poems/ LP

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At the end of each of the three RCs, there was a reflection session. In each session, the children had the opportunity to participate in a kind of vote, in which they chose the poem/LP that they liked the most and if there was any that they did not like, they indicated it too. The blue upward-facing arrow symbolized a positive vote, and the orange downward-facing arrow symbolized a negative vote. See Figure 2.

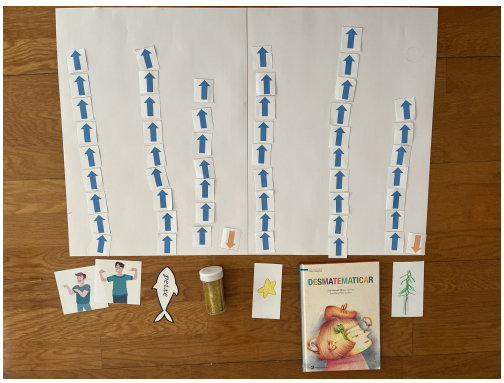

Figure 2: Votes held in the reflection session at the end of the 3rd RC

Several children showed difficulty in choosing just one poem/LP that they liked, note the phrase uttered by *MS* "But it's so cool that I can't choose... I want this, this, this and this!".

Thus, after the first vote, a second one was held, in which the children could select all the poems they had liked. Table 10 shows the data referring to this second vote in each of the RC's.

Table 10: Analysis of children's preferences regarding poems/PL in the reflection sessions

Poem/ Activity Route/ Session	Poetry	Key Mathematical Components	Indicators	
			Like	Disliked
		1st RC		
O Tigre (The Tiger)	Playful	*Numbers and operations*	9	0
Copo copo jericopo (Cup ad Jug)	Playful	*Numbers and operations*	5	1
Convite (Invitation)	Lyric	*Geometry and measure Numbers and operations*	3	2
Contas de somar (Adding sums)	Playful	*Numbers and operations*	2	2
		2nd RC		
Segredo (Secret)	Narrative	*Geometry and measurement Organization and processing of data*	10	0
A minha galinha pinta (My speckled chicken)	Playful	*Numbers and operations*	9	0
O Ovo e Ovo (The egg egg)	Lyric	*Geometry and measurement*	9	0
OVO AVE VOO VOA (Egg Bird fly flying)	Visual	*Geometry and measurement Organization and processing of data*	9	1
Poetry with grandparents	----------	----------	9	1
Book *Versos com reversos*	----------	----------	7	0
		3rd RC		
Meeting with the poet	----------	----------	10	0

Eu, tu (Me, you)	Playful	*Numbers and operations*	9	0
Fresquinho, freguês (Fresh, customer)	Narrative	*Organization and processing of data* *Numbers and operations*	9	0
Ladrão (Thief)	Narrative	----------	9	0
O rei dos trocadilhos (The king of puns)	Narrative	*Geometry and measurement*	7	1
Eucalipto (Eucalyptus)	Visual	*Geometry and measurement*	7	1

All poems/LP had positive votes, and most obtained the positive vote of most of the group.

Focusing now on poetic typologies (Cervera, 1992; Bernardino, 2016) of the poems addressed, Table 11 is presented:

Table 11: Analysis of the poetic typologies of the poems that the children said they liked/disliked

Poetic typology	Number (Nº) of poems mobilized	Nº of "like" votes	Percentage of "like" votes	Nº of "dislike" votes	Percentage of "dislike" votes
Narrative	4	35	36,08%	1	12,50%
Playful	5	34	35,05%	3	37,50%
Visual	2	16	16,49%	2	25,00%
Lyric	2	12	12,37%	2	25,00%

A slight preference of the children for narrative poetry is observed, followed by playful poetry. However, taking into account the representativeness of each poetic typology, the results obtained do not express significant differences in the preference of poetic typology.

Focusing on the mathematical components, we can observe Table 12:

Table 12: Analysis of the mathematical components identified in the LP's corresponding to the poems that the children said they liked the most and least

Mathematical components identified in the LP's	Nº of LP	Nº "like" votes	Percentage of "like" votes	Nº of "dislike" votes	Percentage of "dislike" votes
Geometry and measurement	6	45	37,82%	5	45,45%
Numbers and operations	7	46	38,66%	5	45,45%
Organization and processing of data	3	28	23,53%	1	9,09%

The LP's that involved the *Numbers and operations* were the most indicated by the children when voting for the poems they liked the most, being followed by the LP's who called for the *Geometry and measurement* component. However, similarly to what happened with the poetic typologies, due to the differences in representativeness, it is not possible to extract meaning from the data that allows us to affirm a clear preference of the children for some component. Nevertheless, the children's appreciation of the various's LP's involving each of the three components was clear, with the number of "like" votes being much higher than "dislike".

5. FINAL CONSIDERATIONS

The articulation project was appreciated by 100% of the children who participated in the study, and they not only said they liked it very much, but also expressed the desire for the project to continue. The educators corroborated the above, stating that in addition to showing interest in the

project, the children spontaneously mobilized content and activities carried out in the project sessions for their day-to-day lives.

The analysis of the data allowed us to conclude that the children relate the mediator to the project in a positive way, reinforcing the relevance of this figure in the process of familiarization with literature and mathematics (Macedo & Soeiro, 2009; Viana et *al*. 2023). It also revealed the influence that the activities carried out have on children's interest in the project, corroborating Tapia and Fita (2015).

Development of the taste for poetry

The project is considered to have contributed to the development of the taste for poetry, to the extent that, claiming to know what poetry is, since the end of the 1st RC, at the end of the 3rd RC, 90% of the children said they liked poetry very much. Note the definition that most children attributed to poetry, "playing with words", illustrates the appreciation they developed for it.

As activities that most contributed to the development of the taste for poetry, the educators highlighted the activities that had the word as a central element and the activities that involved the community. Analyzing the children's choices, with regard to the poems they liked the most, we observed that the narrative ones were the most chosen, followed by the playful ones.

Development of the taste for mathematics

Although the approach to mathematics took place in a contextualized and sometimes not explicit way, note that at the end of the project 90, 91% of the children said, they knew what it was, and 100% of the children said they liked it very much.

The children's taste for mathematics was associated mainly with activities carried out during the approach to the poems, namely operations (particularly addition) and measurements. The Educators highlighted the activities that involved the experience of mathematical concepts and their articulation with everyday situations.

Limitations and possibilities for future research/investigative continuity

Research could have a greater reach if all poetic genres and mathematical components had been mobilized with the same representativeness. However, this was not the main focus of the study, so a further study that focuses on the relationship between poetic and mathematical preferences in articulation may be of interest.

Combining the fact that all the children participating in the study stated that they liked the project very much, to the perception of the educators, which corroborates it, as well as the observation made by the researcher, the impact of the project in fostering the taste for poetry and mathematics is considered to be positive. The role of the mediator is particularly emphasized, as well as the activities developed as a way of approaching the poems and the various mathematical, literary and linguistic notions involved.

6. REFERENCES

Altieri, J. (2005). Creating Poetry: Reinforcing Mathematical Concepts. In NCTM. *Teaching Children Mathematics.* (370–374). NCTM.

Amado, J., & Ferreira, S. (2014). A entrevista na investigação em educação. In J. Amado (Coord.), *Manual de Investigação Qualitativa em Educação* (pp. 207-226). Imprensa da Universidade de Coimbra.

Amado, J., Costa, A., & Crusoé, N. (2014). A técnica da análise de conteúdo. In J. Amado (Coord.), *Manual de Investigação Qualitativa em Educação* (pp. 301-352). Imprensa da Universidade de Coimbra.

Azevedo, F. & Melo, I. (2012). Poesia na infância e formação de leitores. *Perspectiva*, 30(3), 925-946, http://www.perspectiva.ufsc

Baptista, I. (2014). *Instrumento de Regulação Ético-Deontológica: Carta Ética*. SPCE.

Bernardino, L. (2016). A matéria poética de Ana Hatherly. *Revista da rede internacional Lyracompoets*, 7, 117-138, http://dx.doi.org/10.21747/21828954/ely7a7

Cervera, J. (1992). *Teoria de la literatura infantil*. Ediciones Mensajero.

Collins, M. & Laski, E. (2018). Digging deeper: Shared deep structures of early literacy and mathematics involve symbolic mapping and relational reasoning. *Early Childhood Research Quarterly. Advance online publication*. https://doi.org/10.1016/j.ecresq.2018.02.008

Coutinho, C. (2013). *Metodologia de Investigação em Ciências Sociais e Humanas - Teoria e Prática*. Almedina.

Coutinho, C., Sousa, A., Dias, A., Bessa, F., Ferreira, M. & Vieira, S. (2009). Investigação-Acção: Metodologias Preferencial nas Práticas Educativas. *Psicologia, Educação e Cultura*, 13 (2), 355-380.

Esteves, M. (2006). Análise de conteúdo. In J. Lima & J. Pacheco (Orgs.), *Fazer investigação: Contributos para a elaboração de dissertações e teses* (105-126). Porto Editora.

Folque, M. (2014). *O aprender a aprender no pré-escolar: o modelo pedagógico do Movimento da Escola Moderna*. (2ª edição). Lisboa: Fundação Calouste Gulbenkian.

Fonseca, A. (2020). A poesia na educação pré-escolar: para lá das rimas e das quadras. *Egitania Sciencia*, 85-96. https://doi.org/10.46691/es.vi.144

Hatherly, A. (1975). *A Reinvenção da Leitura: breve ensaio crítico seguido de textos visuais*. Editorial Futura.

Latorre, A. (2008). *La investigación-acción: Conocer y cambiar la práctica educativa*. Editorial Graó.

Macedo, T. & Soeiro, H. (2009). A emergência da leitura no jardim-de-infância: Os tapetes narrativos. Em F. Azevedo & M. Sardinha (coord.). *Modelos e práticas em literacia*. (pp. 49-62). Lidel.

Maričić, S., Stakić, M., & Malinović-Jovanović, N. (2017). The Role of Literary Content for Children in Preschool Mathematics Education. *Eurasia Journal of Mathematics, Science and Technology Education*, 14(2), 631–642. https://doi.org/10.12973/EJMSTE/80627

Monroe, E., Young, T., Fuentes, D., & Dial. O. (2018). Why Use Children's Literature in Mathematics? In *Deepening Student's Mathematical Understanding with Children's Literature - National Council of Teachers of Mathematics* (pp. 11–35). National Council of Teachers of Mathematics. https://www.nctm.org/Store/Products/Deepening-Student-s-Mathematical-Understanding-with Children-s-Literature/

Pereira, B., & Alencar, A. (2017). Leitura nas séries iniciais: algumas considerações. *HOLOS*, 7, 299-310. https://doi.org/10.15628/holos.2017.5911

Pereira, R., Palhares, P., & Azevedo, F. (2024). Análise de percursos de aprendizagem desenvolvidos com crianças de 4 anos: contributos da articulação entre poesia e matemática in *Bolema* (aceite para publicação).

Silva, I. (Coord.), Marques, L., Mata, L. & Rosa, M. (2016). *Orientações curriculares para a Educação Pré-escolar.* Ministério da Educação/Direção-Geral da Educação (DGE).

Siméon, J. (2015). *A vitamina P: A Poesia, porquê, para quem, como?*. Trinta por uma linha.

Soares, L. C., Côco, V., & Ventorim, S. (2016). Formação continuada na educação infantil: interfaces com o brincar. *HOLOS*, 1, 91–106. https://doi.org/10.15628/holos.2016.3953

Tapia, J. & Fita, E. (2015) *A motivação em sala de aula: o que é, como se faz*. 4. ed. Loyola.

Tinoca, L. (2017). Investigação & Formação contínua. In Conselho Nacional de Educação (Org.), *Lei de Bases do Sistema Educativo: balanço e prospetiva* – Volume II, 741-756. Conselho Nacional de Educação.

Viana, A., Silva, A., Silva, C., Santos, M., Sousa, H., Figueiredo, I., Rodrigues, P., & Sousa, M. (2023). As dificuldades de aprendizagem da matemática na educação infantil e ensino fundamental anos iniciais: uma revisão bibliográfica. (Portuguese). *Revista Foco (Interdisciplinary Studies Journal)*, *16*(10), 1–23. https://doi.org/10.54751/revistafoco.v16n10-135

Literary references

Guedes, T. (2000). *Criatividade precisa-se: na poesia, na narrativa e na área de projecto.* Caminho.

Higino, N. (2008). *Versos diversos.* Trinta por uma linha.

Letria, J. (1992). *O livro das rimas traquinas.* Terramar.

Mangas F. & Mésseder, J. (2002). *Breviário do sol*. Caminho.

Mésseder, J. (1999). *Versos com reversos*. Editorial Caminho.

Mésseder, J. (2016). *Palavras Viageiras*. Xerefé.

Paes, J. (1989). *Poemas para brincar*. Editora Ática.

Ribeiro, J. (2009). *Poemas para Brincalhar*. Porto Editora.

Ribeiro, J. (2011). *Desmatematicar.* Trinta por uma linha.

Santos, A. (1968). *Lidança; Trabalho/liberdade*.

Torga, M. (1956). *Diário VII*. Edição do autor.

Viana, A. (2008). *Bichos diversos em versos.* Texto Editores.

Vieira, A. (1994). *Eu bem vi nascer o sol*. Editorial Caminho.

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