

The sowing of a collective: experiences in teacher training at the UFRN Mathematics Club¹

O semear de um coletivo:
vivências de formação docente no
Clube de Matemática da UFRN

El sembrar de un colectivo:
experiencias de formación docente en el
Club de Matemáticas de la UFRN

Allana Tamires Alves da Silva²

Halana Garcez Borowsky³

Maria Jucimeire dos Santos⁴

ABSTRACT

This article aims to analyze how the practices carried out, grounded in the Teaching Oriented Activity, consolidate the Mathematics Club (CluMat) at the Universidade Federal do Rio Grande do Norte (UFRN) as a space for teacher education. To support this investigation, we adopted as our theoretical foundation, the assumptions of Historical-Cultural Theory, Activity Theory, and Teaching Oriented Activity. In line with this foundation, the methodological approach is organized based on the structure of Activity—composed of need, motive, actions, and operations—which guided the development of the research. Data collection took place through monitoring CluMat's activities throughout 2019. Three undergraduate students in Education, a graduate student in Science and Mathematics Education, and the project's coordinating professor participated in the study. The data were organized into formative episodes selected from the records of observations and monitoring conducted during the project's activities. Given this, the research was guided by the following question: in what ways do the actions developed under the premises of the Teaching Oriented Activity consolidate the UFRN Mathematics Club as a training space for teaching? The data analysis yielded three interpretive axes: (A) repercussions of the actions at the school; (B) the Teaching Oriented Activity as a theoretical-methodological premise; and (C) the construction of collective. The results indicate that CluMat/UFRN constitutes a significant space for teacher training, enabling the integration of theory and practice.

¹ Translated by Luciane de Lima Paim, E-mail: luasreviformatrad@gmail.com.

² Teacher in the Macaíba Municipal School System, Rio Grande do Norte/RN, Brazil. Orcid: <https://orcid.org/0000-0002-7741-8654>; E-mail: allanatamires@gmail.com.

³ Professor at the Institute of Education, Universidade Federal de Rio Grande. Graduate Program in Exact Sciences Education/RN, Brazil. Orcid: <https://orcid.org/0000-0001-6813-1304>; E-mail: halana.borowsky@gmail.com.

⁴ Professor in the Graduate School of Education at the Universidade Federal de Rio Grande do Norte/RN, Brazil. Orcid: <https://orcid.org/0000-0003-0369-4469>; E-mail: jucimeire.santos@ufrn.br.

Keywords: Math Club; Teacher training; Teaching Oriented Activity.

RESUMO

O presente artigo tem por objetivo analisar de que modo as ações vivenciadas, fundamentadas na Atividade Orientadora de Ensino, consolidam o Clube de Matemática (CluMat) da Universidade Federal do Rio Grande do Norte (UFRN) como um espaço de formação docente. Para sustentar essa investigação, adotamos como referencial teórico os pressupostos da Teoria Histórico-Cultural, Teoria da Atividade, e Atividade Orientadora de Ensino. Em consonância com esse fundamento, o percurso metodológico organiza-se a partir da estrutura da Atividade — composta por necessidade, motivo, ações e operações — que orientou o desenvolvimento da investigação. A produção dos dados ocorreu por meio do acompanhamento das ações do CluMat ao longo de 2019. Participaram do estudo três estudantes de graduação em Pedagogia, uma pós-graduanda em Ensino de Ciências e Matemática e a professora coordenadora do projeto. Os dados foram organizados em episódios formativos selecionados a partir dos registros de observações e acompanhamentos realizados durante as atividades do projeto. Diante disso, a pesquisa orientou-se pela seguinte questão: de que modo as ações desenvolvidas sob os pressupostos da Atividade Orientadora de Ensino consolidam o Clube de Matemática da UFRN como um espaço de formação para a docência? A análise dos dados originou três eixos interpretativos: (A) repercussões das ações na escola; (B) a Atividade Orientadora de Ensino como pressuposto teórico-metodológico; e (C) a construção da coletividade. Os resultados indicam que o CluMat/UFRN se configura como um espaço significativo para a formação docente, permitindo a unidade entre teoria e prática.

Palavras-chave: Clube de Matemática; Formação docente; Atividade Orientadora de Ensino.

RESUMEN

El presente artículo tiene como objetivo analizar de qué manera las acciones vividas, basadas en la Actividad Orientadora de la Enseñanza, consolidan el Club de Matemáticas (CluMat) de la Universidad Federal de Río Grande del Norte (UFRN) como un espacio de formación docente. Para sustentar esta investigación, adoptamos como marco teórico los supuestos de la Teoría Histórico-Cultural, la Teoría de la Actividad y la Actividad Orientadora de la Enseñanza. En consonancia con este fundamento, el recorrido metodológico se organiza a partir de la estructura de la Actividad —compuesta por necesidad, motivo, acciones y operaciones— que orientó el desarrollo de la investigación. La recopilación de datos se llevó a cabo mediante el seguimiento de las acciones de CluMat a lo largo de 2019. Participaron en el estudio tres estudiantes de licenciatura en Pedagogía, una estudiante de posgrado en Enseñanza de Ciencias y Matemáticas y la profesora coordinadora del proyecto. Los datos se organizaron en episodios formativos seleccionados a partir de los registros de observaciones y seguimientos realizados durante las actividades del proyecto. Ante esto, la investigación se orientó por la siguiente pregunta: ¿de qué manera las acciones desarrolladas bajo los supuestos de la Actividad Orientadora de la Enseñanza consolidan el Club de Matemáticas de la UFRN como un espacio de formación para la docencia? El análisis de los datos dio lugar a tres ejes interpretativos: (A) repercusiones de las acciones en la escuela; (B) la Actividad Orientadora de la Enseñanza como supuesto teórico-metodológico; y (C) la construcción de la colectividad. Los resultados indican que el CluMat/UFRN se configura como un espacio significativo para la formación docente, permitiendo la unidad entre teoría y práctica.

Palabras clave: Club de Matemáticas; Formación docente; Actividad Orientadora de la Enseñanza.

1 Introduction

We start from the premise that teacher education is not limited to the mere acquisition of theoretical and methodological knowledge; it also involves experiences that foster the critical and reflective development of future teachers. In this educational journey, project-based activities play a significant role, as they require planning, intentionality, and the active participation of those involved. In this sense, designing a project is a human activity that integrates reflection, action, and the transformation of reality, enabling different formative experiences to contribute to the teacher's professional and personal development. Here, we will present the Math Club as a project that can guide teacher training activities.

But what do we mean by "project"? When we refer to the Math Club as a project, we draw on Boutinet's (2002) understanding that the meaning we attribute to the term in our culture is recent, emerging regularly during the 15th century in the forms of *pourjet* and *project*. This meaning conveys the idea of spatial ordering, linked to the Latin origin of the verb *projicio*, which means to throw forward, to expel.

Based on Boutinet's studies of what he calls "project culture," Moura (2013) offers the understanding that a project is one of humanity's creations for organizing its actions toward a specific goal, which occurs within a historical and cultural context, and whose objectification is directly conditioned by planning aimed at an idealized end. In this way, the author seeks an interface between "project culture" and the concept of activity. Thus, it is possible to "consider the project as part of human history for the satisfaction of human needs, which are realized through work and, in so doing, produce human culture" (MOURA, 2013, p. 4).

Regarding the importance of the practice of design, we present Marx's (1985) famous quote comparing the work of the bee and the architect:

A spider performs tasks similar to those of a weaver, and the bee puts more than one human architect to shame with the construction of the honeycombs in its hives. But what distinguishes, from the outset, the worst architect from the best bee is that the architect built the honeycomb in his mind before constructing it in wax. At the end of the work process, the result obtained is one that already existed in the worker's imagination at the very beginning and, therefore, ideally. (MARX, 1985, p. 149-150.)

The bee's work is perfect, and even the worst architect's work has many flaws, but there is a difference between them that goes beyond aesthetics. The architect's work possesses an intellectual sophistication that the bee lacks, namely, the act of designing. When the author states that there is an ideal outcome in the worker's imagination, even before construction begins, he reveals the concept of design, reinforcing the idea that all our human actions, including those of teaching, are planned and must be designed.

Based on this understanding, the Math Club was initially created by Professor Manoel Oriosvaldo de Moura at the Faculty of Education of the Universidade de São Paulo, grounded in the theoretical and methodological foundations of Historical-Cultural Theory (HCT), Activity Theory, and Teaching-Oriented Activity (TOA), and has since expanded to other Higher Education Institutions in Brazil, as noted by Borowsky (2017), Silva (2020), among others.

When discussing the Math Club as a space that facilitates teacher training, we understand that this discussion is part of a body of research being developed in the field of teacher training in mathematics. Studies discussing the Math Club as a space for teacher training and professional development can be found in Borowsky (2017, 2020), Silva (2020), Schuck (2022), Caetano (2023), Marco, Lopes, and Araújo (2023), Lopes, Borowsky, and Cunha (2024), Zwirtes (2024), and Moura (2024), highlighting evidence of this space's potential for shaping pedagogical activity and for the development of teaching from a collaborative perspective.

From this perspective, research conducted within the Mathematics Club has highlighted movements related to the learning of teaching (Ferreira, 2022; Rovetta, 2025), the appropriation of mathematical knowledge (Silva, 2023; Freitas, 2022), the collective organization of teaching (Borowsky, 2023; Lopes, Silva, and Borowsky, 2023), and the construction of meaning regarding the teaching of mathematics and pedagogical activity (Barbosa, 2025; Franco, 2024; Silva and Cedro, 2022). These studies indicate that participation in the planning, design, and development of teaching situations enables participants to mobilize theoretical and methodological knowledge and reflect on pedagogical practice.

In this article, we present the results of a study conducted within the Pedagogy program at the Universidade Federal do Rio Grande do Norte (UFRN). The study was conducted within the context of the Mathematics Club at that institution, linked to the extension project titled “Mathematics Education in Childhood: Pathways to the Organization of Teaching.” Thus, in this study, our objective is to analyze how the activities experienced, grounded in the Teaching Oriented Activity, consolidate the UFRN Mathematics Club as a space for teacher training.

To achieve this objective, we will present the theoretical foundation that guides our understanding of the teacher training process and the training space. Subsequently, we describe the methodological approaches of the research and discuss the analysis of the research data. Finally, we present some considerations arising from the analyses conducted.

2 Theoretical Foundations of the Research

One of the central issues in the field of education concerns understanding how individuals learn and develop. Within the foundation of Historical-Cultural Theory, pioneered by the work of Lev Semyonovich Vygotsky, the starting point is the assumption that human development occurs through the appropriation of historically produced culture. From this perspective, the development of the psyche is understood as an essentially social process, in which the individual, initially a biological being, becomes human through the relationships they establish with others.

In explaining the elements that make up this theory, Asbahr (2011) explains:

As a consequence of dialectical historical materialism, Vygotsky adopts a logic of knowledge—the dialectical logic—a conception of humanity based on historicity and materiality, and a conception of science concerned not with describing reality, but with explaining and transforming it (ASBAHR, 2011, p. 25).

Originating in the field of psychology to understand the development of the human psyche, the Historical-Cultural Theory has also come to be applied in the field of education, seeking to understand educational movements from this perspective. Based on this theory, we understand that education is the means by which the individual becomes human, that is, “[...] education is the process of transmitting and assimilating

historically produced culture; it is through this process that individuals become human and inherit the culture of humanity” (RIGON; ASBAHR; MORETTI, 2010, p. 27).

In this understanding, Vygotsky deepens his studies in the area of learning, conceiving it as progress through teaching; with a view to achieving this, Vygotsky (2014) states that the only good teaching is that which precedes development.

In developing the premises of the Historical-Cultural Theory, Leontiev deepens the studies initiated by Vygotsky, directing his attention to the role of Activity in human development. The process of humanization occurs through primary activities, marked by the position the subject occupies in the system of social relations. We understand that an understanding of the primary activity, from the theoretical perspective on which we base this work, is important to inform research regarding teacher education, considering that a teacher’s primary activity is teaching.

Understanding activity as the complex human-world relationship, Leontiev (2010) defines:

By “activity,” we mean the processes psychologically characterized by what the process as a whole is directed toward (its object), which always coincides with the goal that motivates the subject to perform this activity—that is, the motive (LEONTIEV, 2010, p. 68).

An activity is constituted as such when performed consciously, driven by an intentionality that originates within the individual and sets them in motion in response to a need. Individuals have different needs, including those related to survival itself, such as eating. Based on these needs, the individual generates a motive that guides their activity, so that the actions undertaken become related to this initial motive.

In discussing the structure of human activity, Oliveira (1993) states that Leontiev distinguishes it into three levels of functioning: activity proper, actions, and operations. Actions are understood as processes in which the object and motive do not coincide, while operations refer to the practical aspect of carrying out actions, the conditions under which they are carried out, and the procedures necessary to perform them. Activity itself, in turn, is configured as a complex form of relationship between humans and the world, involving conscious purposes and collective and cooperative action, and is carried out through goal-directed actions performed by the individuals involved in the activity (Oliveira, 1993, p. 97).

Based on the assumptions of Activity Theory, we understand that it is possible to conceive of teacher training based on their primary activity, teaching. From this perspective, Moura (2000) highlights activity as a formative element in both the sphere of teaching and the sphere of learning.

The activity, [...], is the subject's own; it is a problem that triggers a search for a solution, enables the subject to advance their knowledge through the process of analysis and synthesis, and allows them to develop the ability to engage with other knowledge based on the knowledge they acquire as they develop their problem-solving skills. The activity is thus an integral part of the education of both the student and the teacher (MOURA, 2000, p. 35).

Regarding this aspect of teacher training, Moura (2000) writes:

Based on the concept of collectivity, as outlined in Makarenko's thesis, the process of teacher training is a constant search for a way to carry out a project whose outcome is the very reason for the project itself: to realize one's personal and collective vision. This is realized through the teacher's own learning and through the desire to help others learn to process information consciously when solving problems. The measure of change in the teacher's frame of reference lies in their actions. Thus, what we need is to establish the direction in which the individual should move, and from there, determine whether they are developing or not. It is the interaction among individuals that will trigger the process of negotiating the values at stake and lead to the pursuit of the realization of the pedagogical project (MOURA, 2000, p. 46).

Thus, we understand that the assumptions underlying the activity help us reflect on the Math Club and on the possibilities of establishing it as a space conducive to reflection on the teacher's practice, especially through an understanding of the process of organizing instruction based on the contributions of Leontiev (1978, 1983), who conceives of activity as a central element in human development. From this perspective, Moura et al. (2016) discuss how this concept can guide teaching practice by proposing the Teaching Oriented Activity (TOA).

The TOA is grounded in the principles of HCT and in the understanding that psychological development occurs through a process of internalization, in which social interactions play a fundamental role. Initially, psychological functions manifest themselves on the social (interpsychic) level and subsequently come to constitute the individual (intrapsychic) level. Thus, the learning process is directly related to cultural

mediations and social interactions, not merely the result of biological conditions or spontaneous developmental processes (MOURA et al., 2016).

Considering the school context, Moura et al. (2016), drawing on the studies of Davidov (1987), argue that the activity of studying has a structure composed of different interconnected elements. Among these, the study task stands out as its fundamental unit, whose purpose is not limited to solving a specific problem but to the transformation of the subject themselves in the learning process. Another element is content, understood as elaborated forms of social consciousness, such as science, art, and ethics, which constitute historically produced theoretical knowledge.

The study activity also involves study actions that allow the student to identify general relationships present in concepts, understand structuring ideas of a given field of knowledge, and establish relationships between the abstract and the concrete. Associated with these actions are self-assessment and self-regulation, which enable students to monitor their own learning journey, analyzing their initial conditions, the development of activities, and the results achieved.

When these elements are organized in a coordinated manner and mediated by the teacher's actions, the possibilities for appropriating historically produced knowledge are expanded. In this process, the organization of teaching plays a fundamental role, since the intentionality in the teacher's organization of instruction guides the development of students' theoretical thinking. For Davidov, as reported by Moura et al. (2016), this formation occurs through the movement from the abstract to the concrete, in which the student starts from an understanding of more general relationships to arrive at the analysis of particular situations.

Rubtsov (1996), in dialogue with Davidov's contributions, uses the term "learning activity" to highlight the intentional and organized nature of the school educational process. From this perspective, learning results from a planned, systematized teaching activity oriented toward the formation of theoretical thinking. Moura et al. (2016) use this expression in the same sense, understanding study as an action oriented toward learning.

Another relevant aspect highlighted by Rubtsov refers to the collective dimension of learning activity. According to the author, learning in collective contexts involves the distribution of actions among participants, the exchange of modes of action, communication, and mutual understanding, as well as the planning of individual actions

and joint reflection on the process developed. These elements highlight the importance of social interaction in the construction of knowledge, reinforcing the principles of the historical-cultural approach that underpins the Teaching Oriented Activity.

Rubtsov's (1996) contributions have been applied to the discussion of teacher education. An example of this is the work of Santos (2023), who uses the author's concepts (exchange of modes of action, communication, mutual understanding, and reflection) to reveal aspects of a training process driven by the core of a teaching program, composed of higher education faculty, teacher candidates, and elementary and secondary school teachers.

Teacher education, divided into initial and continuing dimensions, extends from undergraduate studies to professional development. According to Moretti (2007), the integration of theory and practice in continuing education is what enables the transformation of school reality. To this end, such a process must stem from the real demands of teachers' daily lives, giving meaning to knowledge and empowering teachers. In this way, training can provide the subjective conditions (SANTOS, 2023) necessary for teachers to reorganize and improve their teaching practice.

2.1 Training for Mathematics Teachers

Neste This article focuses on teacher education, understood from this theoretical perspective as an activity aimed at developing the individual as a professional whose work centers on teaching. In other words, for teacher education—whether initial or continuing—to effectively function as an **educational activity**, it is imperative that there be an appropriate structure in place and that the individual be committed to the goals of these processes.

We understand that the process of humanization is enhanced by school education when it enables students to acquire theoretical knowledge, such as art, science, and mathematics itself. As a historical and cultural product, mathematics has its own specific characteristics, having been developed to meet historically situated human needs (MOURA, 2017). Consequently, the organization of teaching in this field presents particularities: it requires that the teacher master specific knowledge, understand the logical and historical development of the concept, and know how to articulate the dialectical unity of content and form (ESTEVES & SOUSA, 2017).

In this vein, research such as that by Esteves and Sousa (2017) and Lopes (2018) has been discussing how the training of mathematics teachers can be structured based on the principles of Historical-Cultural Theory, Activity Theory, and Teaching Oriented Activity (TOA). The basic condition for such a structure is to consider the needs of the individual, providing conditions for them to take the lead in the process. Furthermore, as Lopes (2018) points out, training is expected to enable:

- A deeper theoretical understanding of the social role of schools in the process of humanization;
- The acquisition of mathematical knowledge as a catalyst for human development;
- Mastery of teaching methodologies focused on student learning;
- The sharing of experiences among different stakeholders, with a view to the personal and professional development of student teachers and practicing teachers.

Finally, we would like to point out that the UFRN Mathematics Club has incorporated the theoretical principles discussed here. The following section details the methodological approach taken in this study.

3 Research methodology

In an effort to analyze how the activities carried out as part of the Teaching Oriented Activity have helped establish the Mathematics Club (CluMat) at the Universidade Federal do Rio Grande do Norte (UFRN) as a space for teacher training, this study draws on data generated from the activities conducted within this project, which began in April 2019. Initially, the group consisted of three undergraduate students in Education and the project's coordinating professor. The meetings took place weekly and were characterized by providing a learning environment rich in emotional support.

The project was affiliated with the Research Group on Mathematics and Portuguese Language Education (CONTAR/UFRN), which is part of the Graduate Program in Education (PPGED/UFRN) and the Graduate Program in Science and Mathematics Education (PPGECM/UFRN). As a result, a doctoral student in Science and Mathematics Education became part of CluMat/UFRN's activities. Thus, the participants in this study were: two undergraduate students in Education, a doctoral student in Science and Mathematics Education (a college professor), and the coordinating professor.

To preserve the participants' anonymity, in accordance with ethical research guidelines, we will use fictitious names when presenting their statements and interactions. Thus, from this point forward, they will be identified as **Bromélia** (undergraduate student), **Mandacaru** (undergraduate student), and **Helicônia** (doctoral student), names inspired by flowers typical of the Northeast region of Brazil, a choice that also seeks to highlight the natural richness of our region. In addition to them, the researcher and the project coordinator appear in the scenes.

Given the need to understand the project's formative dynamics, the research was guided by the following question: in what way, based on the actions developed under the premises of the Teaching Oriented Activity, does the UFRN Mathematics Club characterize itself as a training space for teachers who teach mathematics?

To answer this question, we adopted the Activity structure (LEONTIEV, 2010), as presented in the theoretical study, as the methodological foundation guiding this research.

[...] Educational research, as an activity, should aim to produce theoretical and practical syntheses that contribute to laying the groundwork for the personal development of those involved in educational work—a task that is essentially collective in nature, both in teaching and in research. (MOURA, 2017, p. 09).

By understanding research as an activity, we have structured the methodological approach of this study in accordance with Borowsky's (2017) foundation. Thus, we present the need that led us to this study, what motivated us, the actions we took to achieve our objective, and the steps carried out within the organization to achieve the intended goal.

The motive leads to the activity when it coincides with its object. For Leontiev (2010, p. 69), "the object of an action is, therefore, nothing more than its recognized direct target." Piotto, Asbahr, and Furlanetto (2017, p. 111), drawing on Leontiev's work, explain that "the motive is the link between a need and an object, for isolated objects and needs do not produce activities; activity exists only if there is a motive. In other words, the motive is the need realized in an objective form."

Thus, we understand that the work had an effective motive, for what motivated us was not merely obtaining a certificate — which would be an understandable

motive—but rather truly understanding how to organize a project in order to create a space for teacher training.

To analyze how the actions experienced, grounded in the Teaching Oriented Activity, consolidate CluMat/UFRN as a space for teacher training, we identified certain actions that made this possible. For an action to emerge and be carried out, its objective must become apparent to the individual in relation to the motive of the activity of which they are a part. From this theoretical perspective, we understand that action is an element that constitutes the activity and that its object is, consequently, nothing more than its direct, recognized target (LEONTIEV, 2010, p. 69).

Based on this understanding of research actions within the flow of activity, we present the main actions carried out during the research:

- A theoretical study of the foundations that underpin our teaching practice, conducted on an ongoing basis throughout the project;
- Outreach activities of the Math Club at the Clara Camarão Municipal Early Childhood Education Center (CMEI), located in the Planalto neighborhood of Natal, Rio Grande do Norte, with seven teachers working with 180 children aged 3 to 5 years and 11 months;
- Reflection Session, which served as an opportunity to evaluate the other activities carried out in the project. According to Ibiapina (2008), this session constitutes a research method that goes beyond mere observation. Through it, the researcher analyzes the dialogues produced within the group, characterized by the exchange of opinions and the sharing of learning experiences.

These activities collectively summarize the training initiatives carried out as part of the project in 2019, guided by the objective that drove their implementation. It was through the implementation of these activities—particularly during the reflective phase—that we gathered the data for this study. Based on the interactions and dialogues that took place at that time, the data were organized into training scenes and episodes, which guided the analysis process presented in the following section.

4 The Math Club on the Move

After capturing reality and collecting data, it becomes necessary to organize them by transcribing and analyzing the recorded statements of the research participants. To this end, we make use of what Moura (2000) refers to as “formative episodes,” which.

[...] are an attempt to develop a method for analyzing interdependencies in isolation, focusing on formative episodes—defined by the symbolic tools used to reveal the intention to influence the individuals involved in the activity (MOURA, 2000, p. 64).

It is important to emphasize that episodes are not composed of a series of linear actions, but “may be written or spoken, consisting of defining scenes that characterize them” (MOURA, 2000, p. 64). In this study, we have identified several episodes, composed of scenes, that reveal the feelings and reflections of the research participants, and that seek to reveal the multiple determinants and essential relationships that enable an understanding of the phenomenon beyond its surface appearance and immediate manifestations. Thus, below we present three themes that emerged from our analysis, namely: Repercussions of actions at school; TOA as a theoretical and methodological foundation; and, in search of a collective.

4.1 Impact of the actions at the school

Among the initiatives carried out by CluMat/UFRN, one of the highlights is the engagement with the CMEI Clara Camarão, where a teaching unit on measurement was conducted with the students. In this first analysis, we seek to discuss the repercussions of the initiatives carried out in the school setting—both among students and teachers—and the impacts of this process on the professional development of the undergraduate students participating in the project.

The collaboration between school and university is a central aspect of the proposal, as it stems from the understanding that education research requires a direct relationship with the school context. In this regard, Moura et al. (2010, p. 89) state that

To view the school as the primary social setting for the acquisition of historically produced knowledge is necessarily to assume that the teacher’s actions must be intentionally organized for that purpose (MOURA, 2010, p. 89).

In this regard, Table 1 shows the impact of the club's activities on the school, which is viewed as a space for learning and development.

Table 01 - Scene 1: The Impact of the Club's Activities on the School

Scene 1: The Coordinator asks the students what aspects they found most relevant regarding the activities carried out at the school.
1. Mandacaru: What I found really important was that, before we started the activity with the children, the lead teacher held this training session with the teachers. So, they gained the knowledge to reflect on mathematics education in early childhood. And it was really great when we read that text by Manoel Oriosvaldo de Moura; they recalled memories from their own childhoods: what their teachers were like, how they learned. The highlight was when they began to see how that had changed their lives and their perception of math. And they were able to reflect on how the approach they had experienced in their own childhoods was flawed and that they shouldn't be replicating it with their students. So, it was a really great conversation. Really good, actually. At the other training session we attended, the coordinating teacher spoke about the collective and the Teaching Oriented Activity. The teachers said they were able to continue our work. So, they kept taking measurements of the students and the furniture in the classroom. And the students would make references, saying: "Oh, teacher, just like that day we watched the video with the girls." "Just like that day we played the little ant game." 2. Helicônia: So, they were adopting this teaching method for themselves. 3. Mandacaru: Exactly! So that's how it was, a little seed we planted that kept sprouting.

Source: Research data.

The importance of establishing a space for continuing professional development for teachers in the school context is evident. As Moretti (2007) points out, "continuing professional development for teachers is a process that builds on initial training and aims to transform the school environment by integrating theory and teaching practice" (p. 24). This recognition of the importance of continuing education and the integration of theory and practice is also reflected in Mandacaru's observations.

The study of the theory to be used in the educational proposal by the teachers, when it took place before their contact with the children, shed light on their practices. For a theoretical foundation enables the individual to interpret reality and act upon it. An example of this occurred when the teachers began to recall how they themselves had been taught mathematics. During the study, they concluded that they should move beyond the negative, mechanical, and detached approach to the students' reality, recognizing that they could not replicate it.

Based on the remarks of one of the teachers, presented by Mandacaru, regarding the continuation of work with the concept of measurement, we can infer that, in a certain way, the activities of the Math Club impacted pedagogical work in their classrooms. The teachers demonstrated, in their statements, that they understood some principles of the Teaching Oriented Activity (TOA), such as the students' active participation in their learning process, through the implementation of actions intentionally planned and organized by the club members (Moura et al., 2016). The importance of mediation carried out by both the teachers and the teaching tools and materials used, such as the video, is also evident.

Furthermore, it is observed that the experience in the Math Club enables evaluative reflections on their own teacher training, driving the improvement of their pedagogical practice, as reported by Mandacaru. Finally, there are indications that the teachers generally adopted a form of teaching organization grounded in the TOA, which they began to develop in their daily teaching practices, starting from the "seed planted," as mentioned in statement 2.

Thus, by understanding the Teaching Oriented Activity as a teacher training activity — characterized by the dynamics of the educational process and established as an activity for both the teacher and the student — we can perceive the relevance of establishing a space for continuing education for teachers within the school context. This recognition of the importance of ongoing training and the integration of theory and practice is also reflected in Mandacaru's observations. Based on this, we turn to scene 2, where the student Bromélia says that she perceives herself in a process of professional development by applying the principles of TOA in the organization of her educational practices.

4.2 TOA as a theoretical and methodological reference

As discussed in the theoretical foundation, the Teaching Oriented Activity provides a model for organizing pedagogical practices designed to ensure that schools fulfill their fundamental role: to promote students' acquisition of theoretical knowledge and to foster the development of their abilities and personalities. Below, we present Table 02, which highlights the impact of CluMat's initiatives on the teacher training of the project participants.

Table 02 - Scene 2:Formative nature of the Mathematics Club.

Scene 2: In response to the coordinator's question about how the Math Club's activities have influenced the way teaching is organized and its relationship to the course's subjects, student Mandacaru discusses her experience.
Mandacaru: We're applying what we've learned at CluMat to our academic journey. In fact, in everything we do, we draw on the knowledge we gained at CluMat. We've started sharing this with others. I was explaining to Prof. Halana that for the Early Childhood Education course, I had to lead a workshop, but the groups were assigned by lottery, and I didn't get math. I was upset. (laughs) But the group that got math said that Bromélia had come up with a really cool idea, the "Princess Bromélia" one, which was the one we took to the First Meeting of Math Clubs. They said Bromélia presented that activity and it was fantastic, because no one had realized you could work on math using that playful story. It was really cool. People are eager to see the project, including Malu, the girl who did the project with Bromélia. And she said there's no way to separate math from the individual because it's historically constructed. It was very moving, because they finally stopped demonizing math.

Source: Research data.

It is important to note, in this account, how TOA becomes a general mode of action at different stages of the academic journey for a student teacher participating in the Math Club. This general mode also spreads to other settings. The playful element is another important point in Mandacaru's statement. Within the TOA foundation, the playful aspect is most evident in the design of the Learning Triggering Situation, which can take the form of a Virtual Story, a Game, or an Emerging Everyday Situation (MOURA, 1996; MOURA et al., 2016). The Math Club incorporates playful elements with the aim of making math instruction more engaging, a subject so often stigmatized due to its characteristic seriousness, as reflected in the traditional and mechanical teaching methods employed by the teacher.

The scene under analysis shows us that the activities carried out in the club play an educational role, as the student states that she draws on the learning acquired in the project to develop other activities within the university context. This account allows us to infer that the Math Club constitutes an educational project, "as one that can be constituted as a teacher's activity, in which the teacher, by intentionally engaging with their object (teaching), is also educated." (MARCO; LOPES; MOURA; SOUSA, 2018, p.301).

From the perspective of historical-cultural theory, the characteristics of a training program are: the organization of the group, the need to develop teaching activities for the classroom, and the sharing of knowledge and practices. (MARCO; LOPES; MOURA; SOUSA, 2018, p.302).

Thus, we believe that the Math Club can serve as an educational project, as it provides a space for sharing activities; its members are free to express themselves, have a voice and a place within the group, and their work establishes a connection between teaching and learning; there is also a concern with the need to create teaching activities for the classrooms where we are developing the instructional units, ensuring that these are stimulating and challenging, and that they make students think; finally, we believe that CluMat is an educational project due to the organization of the collective group, which is characterized by the sharing of activities, understanding that individuals are shaped through their relationships with others. We will address the aspect of collectivity in greater detail in the next section of analysis.

2.3 In Search of a Collective

Through research on the club, we have learned that “collectivity” is not simply a synonym for “group,” but rather a concept with theoretical foundations that pertains to the approach we take toward something far greater than simply being in a group. Thus, for Petrovski (1984), the collective is a special group in which interpersonal relationships are mediated by the content of the concrete activity, allowing us to observe the overall structure of the collective.

Since this is a topic central to our project, we present a scene consisting of four lines of dialogue, in which the coordinator summarizes some characteristics of a collective, based on Petrovski (1984). The author highlights three fundamental characteristics: collectivist self-determination, cohesion, and emotional familiarization. Therefore, we will address each of these characteristics during the presentation of scenes 3.1, 3.2, and 3.3, with the intention of facilitating understanding of the concept to be presented.

The first quality of utmost importance in the collective’s interpersonal relationships is the **emotional familiarization** of each individual’s personality with the collective as a whole. One of the primary characteristics of the collective is permanent unity, both in good times and in bad.

A true collective is characterized by a sense of mutual understanding, both in successes and failures, as well as in emotional warmth and empathy, in joy and pride in each other's achievements, in the conviction that the group in question is worthy of being called a true collective, and also in the openness that must exist to allow outsiders willing to contribute to the achievement of common goals to join the collective (PETROVSKI, 1986, p. 135).

Recognizing that the Math Club is characterized by this sense of belonging and close-knit relationships at all times, the Coordinator discusses emotional connection in line 1 of scene 3.1, presented in Table 03.

Table 03 - Scene 3.1: A lesson about Emotional Familiarization.

Scene 3.1: In discussing the importance of collectivity for the project, the coordinator provides a brief overview of the topic.
1.Coordinator: I think this is really important! Because we grow stronger as a collective through both our successes and our mistakes. It is also through our contradictions that we shape the identity of our collective. 2. These are the three characteristics of collectivity that Petrovski speaks of. One is emotional familiarity—that we are together in our mistakes and our successes—which is what Mandacaru is expressing [in scene 6, line 1] [...]

Source: Research data.

This emotional connection is particularly evident in Line 1 of Scene 2, when Mandacaru recognizes qualities in Bromélia and seeks to learn from them to improve her teaching practice. It is through this process of acknowledging the strengths and weaknesses of each individual and their practices that collective growth occurs, and consequently, individual growth.

Collectivist self-determination is a characteristic of the collective, identified by its opposition to conformism, by having well-defined values where all its members are in agreement, and by not being easily swayed by influences external to the collective. Regarding this characteristic, Petrovski (1984) writes:

Collectivist self-determination arises when an individual's behavior in the face of particularly organized group pressure is not driven by the group's direct influence or by the individual's susceptibility to suggestion, but rather by the tasks and goals of the activity accepted within the group, as well as by stable value orientations. Unlike what occurs in a diffuse group, in a collective, collectivist self-determination constitutes the predominant mode of the individual's reaction to group pressure and is therefore an inherent attribute of the group's structure.. (PETROVSKI, 1984, p.28)

Table 04 - Scene 3.2: A lesson about Collectivist Self-Determination

Scene 3.2: In discussing the importance of collectivity for the project, the coordinator provides a brief overview of the topic.
3. Coordinator: [...]the other is collective self-determination. It means that we commit ourselves to our collective. Because we're not going to settle for what didn't work out. It didn't work out, but wait a minute—what are we going to do together to make it work? In our case, it's teaching. "What do we do now?" Well, let's think about it together. We don't settle for the status quo or for what went wrong. We're going to strive to achieve these gains within our collective.

Source: Research data.

Collective self-determination was clearly evident among us when we planned and carried out the teaching unit on measurements at school. During that time, we faced significant challenges, mainly because we were beginners, both in our studies of TOA and in the development of Learning Triggers. But in the face of these difficulties, our group never gave up or settled for less. We sought out theoretical strategies and also sought help from more experienced teachers, and we managed to complete the teaching proposal satisfactorily, which contributed to our development and training as future educators.

The third important characteristic of the collective is its cohesion. Following the same principles of collectivist self-determination, cohesion encourages the collective to face difficulties more easily and harmoniously, creating better conditions for personality development within the group. Petrovski (1986) defines cohesion as:

[...] unity is a characteristic of the system of relationships within a group that reflects the degree to which the group's values, attitudes, and positions align with the goals (people, tasks, ideas, events) that are most important to the group as a whole. (PETROVSKI, 1986, p.135)

In scene 3.3, the Coordinator continues to explain another characteristic of a strong collective, this time focusing on **cohesion**.

Table 05 - Scene 3.3: A lesson about Cohesion

Scene 3.3: In discussing the importance of collectivity for the project, the coordinator provides a brief overview of the topic.
4. Coordinator: And the other characteristic is cohesion. Cohesion, as the word implies, is when we share a common goal, when we feel a sense of connection with one another. And no matter how many disagreements there may be, we always ask ourselves: well, what is our collective purpose? And we always find common ground within that goal that unites us. We have a common goal, which for many is like a project: we want to learn, to bring mathematical knowledge to the children, to develop as teachers, to contribute to the training of other teachers, and to engage in the education program by showing that math is cool. So we have common goals that go far beyond what we do sitting here, discussing teaching activities. So, these characteristics, even though we are a recent collective, are the characteristics that guide us. And the Math Club, like this project, can serve as a training model that values this sense of collectivity.

Source: Research data.

The Math Club demonstrates cohesion when our goals and perspectives as members of this group align. This does not mean that we will always agree on every issue, but the more our views align and the closer our theoretical foundation are, the stronger and more cohesive our group becomes.

3 Final considerations

In this study, we seek to analyze how the activities carried out, grounded in the Teaching Oriented Activity, establish the Mathematics Club at the Universidade Federal do Rio Grande do Norte as a space for teacher training. To this end, we draw on data generated from the activities carried out in the project, using the Activity structure (LEONTIEV, 2010) as our methodological and guiding foundation, which allowed us to confirm that CluMat/UFRN is effectively established as this structured training space.

Drawing on the theoretical and methodological foundations of Historical-Cultural Theory and Activity Theory, we sought to understand how teacher training occurs, grounded in an understanding of the process of humanization. We observed that this development takes place through work, that the individual develops through their dominant activity, which in the case of the teacher is the activity of teaching. Based on this principle, we monitored and observed the activities carried out by CluMat in 2019, selecting research data which we present in the format of formative episodes (MOURA, 2000), through three axes of analysis, as presented below.

The first axis, the **Repercussions of the actions at the school**, presents the integration of the Math Club into the school context, an opportunity for the research participants to experience the daily life of the school environment—an aspect prioritized by the characteristic triad of projects developed at the university: research, teaching, and extension, which aim for the individual's holistic development.

The activities at the school initially took place through a collective study of the TOA foundation and its theoretical assumptions, encouraging the teachers to reflect on their childhood experiences and motivating them to move beyond the mechanical teaching of mathematics. The prior study of the theory enabled the teachers to glimpse new perspectives for teaching mathematics, reflecting, as we observed in the statements from scene 1, on their pedagogical practices, even at times when the club was not physically present at the school.

The second axis, **TOA as a theoretical and methodological foundation**, is comprised of Scene 2, which highlights the formative nature of the Math Club, when student Mandacaru reports that she incorporated the teaching unit proposals developed within the club's context into an undergraduate course. this action highlights how the teaching organization plays a significant role in teacher training, as it guides and illuminates the path that is constructed within the teaching-learning relationship.

The use of playful elements (such as short stories and virtual stories) in the Learning Trigger Situation helps demystify and remove the “seriousness” historically associated with mathematics, thereby enabling a reframing of the perspective that students and society at large hold toward this area of knowledge. The TOA study allows us to understand the club as an educational project, as it integrates collective planning, the sharing of actions, and the real need to create playful teaching activities that address the needs of those involved in the teaching and learning process.

The final axis of analysis, **In Search of a Collective**, brings together the third educational episode, consisting of a scene composed of statements 1, 2, and 3, which highlights the relevance of collectivity in the statements of the research participants. In it, the Coordinator presents fundamental characteristics of a collective: personal familiarity, related to the sense of belonging; collectivist self-determination, linked to the commitment to the common good; and cohesion, associated with the sharing of goals and values.

This discussion highlights the importance of human formation in the process of teacher development and emphasizes the group's appropriation of the concept of collectivity, understood not merely as unity but as a theoretical concept grounded in Petrovski (1986).

Throughout the observation and monitoring of the club's activities, it was possible to experience the characteristics of this collectivity we are studying. **Emotional familiarity** is evident in the mutual support and affection present during moments of study and group work, as seen in scene 2, when Mandacaru says she began sharing the theoretical knowledge of TOA with others. In this statement, we can also perceive collectivist **self-determination** and **cohesion**, as it shows that the students are jointly overcoming the challenges of planning a didactic teaching proposal, with a view to aligning objectives and values in favor of mathematics education.

We observe, in the actions of CluMat UFRN, that a collective is defined by what it is, and its characteristics are imprinted in all its actions. This is not a mere attribute, but an essence that cannot be separated from what truly constitutes a "true and good collective" (BOROWSKY, 2017, p.70).

The establishment of the Mathematics Club at UFRN—by bridging the gap between the university and schools, fostering teacher reflection grounded in the theoretical and methodological principles of the Teaching Oriented Activity, and strengthening a genuine sense of community—proves to be a unique setting for teacher education. This is because it proposes a practice that seeks to transcend technical teaching, promoting the development of theoretical thinking and the humanization of the individuals involved, thereby preparing future teachers in a comprehensive manner.

4 Referências

ASBAHR, F. S. F. *"Por que aprender isso, professora?" Sentido pessoal e atividade de estudo na Psicologia Histórico-Cultural*. 2011. 220 f. Tese (Doutorado Psicologia) - Universidade de São Paulo. São Paulo, 2011. DOI: <https://doi.org/10.11606/t.47.2011.tde-24032011-094830>

BARBOSA, C. R. *O movimento de mudança de sentido pessoal da atividade pedagógica por professores em ações de estudo no Clube de Matemática*. 2025. Tese (Doutorado em Educação em Ciências e Matemática) – Universidade Federal de Goiás, Goiânia, 2025.

BOUTINET, J. P. *Antropologia do projeto*. Porto Alegre: Artmed, 2002.

BOROWSKY, H. G.; LOPES, A. R. L. V. Movimentos formativos no Clube de Matemática: o Projeto Orientador de Atividade. *Revista Eletrônica de Educação*, São Carlos, v. 14, p. 1-15, 2023. DOI: <https://doi.org/10.14244/198271996246>

BOROWSKY, H. G. A Atividade Orientadora de Ensino como princípio do Clube de Matemática: caminhos para a formação docente. *Obutchénie: Revista de Didática e Psicologia Pedagógica*, v. 4, p. 509-533, 2020. DOI: <https://doi.org/10.14393/OBv4n2.a2020-57494>

BOROWSKY, H.G. *Os movimentos de formação docente no projeto orientador de atividade*. 2017. 232fls. Tese (Doutorado em Educação) – UFSM. Santa Maria, 2017.

CAETANO, D. G. *Aprendizagem da docência no Clube de Matemática*. 2023. Tese (Doutorado em Educação em Ciências e Matemática) – Universidade Federal de Goiás, Goiânia, 2023.

ESTEVES, A. K.; SOUZA, N. M. M. de. Conteúdo e forma na atividade de Formação do Professor que Ensina Matemática nos anos iniciais. In: MORETTI, Vanessa Dias; CEDRO, Wellington Lima (org.). *Educação Matemática e a Teoria Histórico-Cultural: um olhar sobre as pesquisas*. Campinas, SP: Mercado de Letras, 2017. p. 61-86. Série Educação Matemática.

FERREIRA, J. F. *A aprendizagem para a docência no desencadeamento de ações no CluMat a partir da sistematização da síntese histórica do conceito de Número Natural*. 2022. Dissertação (Mestrado em Ensino de Ciências e Matemática) – Universidade Federal do Rio Grande do Norte, Natal, 2022.

FRANCO, S. A. B. *Atribuições de sentidos pessoais dos professores que ensinam matemática nos anos iniciais sobre a ludicidade na formação continuada: contribuições do Clube de Matemática*. 2024. Dissertação (Mestrado em Educação) – Universidade Federal de São Paulo, São Paulo, 2024.

FREITAS, J. R. G. *Os nexos conceituais, a ludicidade e as ações coletivas no processo de aprendizagem de geometria no Clube de Matemática*. 2022. Dissertação (Mestrado em Educação em Ciências e Matemática) – Universidade Federal de Goiás, Goiânia, 2022.

IBIAPINA, I. M. L. M. *Pesquisa colaborativa: investigação, formação e produção de conhecimentos*. Brasília: Líber, 2008.

LEONTIEV, A.N. Uma contribuição à teoria do desenvolvimento da psique infantil. In.:

VIGOTSKII, L.S. LURIA, A.R. LEONTIEV, A.N. *Linguagem, Desenvolvimento e Aprendizagem*. Tradução de: Maria da Pena Villalobos. - 11a edição - São Paulo: ícone, 2010, p. 46-83.

LEONTIEV, A.N. O desenvolvimento do psiquismo. Lisboa: Horizonte, Página: 261-284. Lisboa, 1978.

LOPES, A. R. L. V.; BOROWSKY, H. G.; CUNHA, L. P. O Clube de Matemática como espaço de aprender e ensinar matemática. *Revista Ibero-Americana de Estudos em Educação*, v. 19, p. e024071-19, 2024. DOI: <https://doi.org/10.21723/riasee.v19iesp.2.18559>

LOPES, A. R. L. V.; SILVA, D. S. G.; BOROWSKY, H. G.; PERLIN, P. Formação docente na organização do ensino no Clube de Matemática. In: SILVA, S. A. F.; CÔCO, D. (org.). *Clube de Matemática: experiências didático-formativas*. São Carlos: Pedro & João Editores; Edifes, 2023. p. 43-60.

LOPES, A. R. L. V. Processos Formativos e a aprendizagem da docência: alguns Princípios Orientadores. In: TREVISOL, Maria Teresa Ceron; FELDKERCHER, Nadiane; PENSIN, Daniela Pederiva (org.). *Diálogos Sobre a Formação Docente e Práticas de Ensino*. Campinas, Sp: Mercado de Letras, 2018. p. 107-134.

MARCO, F. F.; LOPES, A. R. L. V.; ARAÚJO, B. P. O Clube de Matemática e a formação inicial de professores que ensinam matemática. *Revista de Educação Pública*, v. 32, p. 799-820, 2023. DOI: <https://doi.org/https://doi.org/10.29286/rep.v32ijan/dez.14482>

MARCO, F.M.; LOPES, A.R.L.V.; MOURA, M. O.; SOUSA, M.C. A constituição de um projeto formativo: implicações para o professor que ensina matemática. *Educação Unisinos*, v. 22, n. 4, p. 298-306, outubro/dezembro 2018.

MARX, K. O Capital: crítica da economia política. São Paulo, Abril Cultural, 1985.

MORETTI, V.D. 2007. *Professores de matemática em atividade de ensino: uma perspectiva histórico-cultural para a formação docente*. São Paulo, SP. Tese de Doutorado. Universidade de São Paulo, 207 p.

MOURA, M. O. de. Possibilidades da formação docente: as especificidades do Clube de Matemática e da Oficina Pedagógica de Matemática. In: SILVA, M. M. (org.). *Professores que ensinam matemática: desafios e possibilidades na formação inicial e continuada*. Curitiba: CRV, 2024. p. 15-31.

MOURA, M. O. de. A objetivação do currículo na atividade pedagógica. *Revista Obutchénie*, [S.L.], v. 1, n. 1, p. 98-128, 15 mar. 2017. EDUFU - Editora da Universidade Federal de Uberlândia. DOI: <https://doi.org/10.14393/OBv1n1a2017-5>

MOURA, M. O. de; SFORNI, M. S. de F.; LOPES, A. R. L. V. A objetivação do ensino e o desenvolvimento do modo geral da aprendizagem da atividade pedagógica. In: MOURA, Manoel Oriosvaldo de (org.). *Educação Escolar e pesquisa na Teoria Histórico-Cultural*. São Paulo: Editora Loyola, 2017. p. 71-99

MOURA, M. O. de et. al. A atividade Orientadora de Ensino como unidade entre ensino e aprendizagem. In: MOURA, Manoel Oriosvaldo de (org.). *A atividade pedagógica na Teoria Histórico-Cultural*. 2. ed. Campinas, SP: Autores Associados, 2016. Cap. 4. p. 93-125.

MOURA, M. O. Teoria da Atividade: contribuições para a pesquisa em Educação Matemática. In: *ENCONTRO NACIONAL DE EDUCAÇÃO MATEMÁTICA*. Anais...2013. ISSN 2178-034X.

MOURA, M.O. (Org.) *A atividade pedagógica na teoria Histórico-Cultural*. Brasília: Liber livro, 2010.

MOURA, M. O. *O educador matemático na coletividade de formação: uma experiência com a escola pública*. 2000. Tese (Livre-Docência) -Universidade de São Paulo, São Paulo, SP, 2000.

MOURA, M. O. A atividade de ensino como unidade formadora. *Bolema*, Rio Claro, n.12, p.29-43, 1996.

OLIVEIRA, M. K. de. Vygotsky: aprendizado e desenvolvimento um processo sócio-histórico. São Paulo: Scipione, 1993. (Série Pensamento e ação no magistério).

ROVETTA, O. M. *Aprendizagem da docência de licenciandos em matemática: um movimento de estudo e organização de ações de ensino de geometria no Clube de Matemática*. 2025. Tese (Doutorado em Educação em Ciências e Matemática) – Instituto Federal do Espírito Santo, Vitória, 2025.

PETROVSKI, A. V. *Psicología General: Manual didáctico para los Institutos de Pedagogía*. 3. ed. Moscú: Progreso, 1986a.

PETROVSKI, A. V. *Personalidad, Actividad y Colectividad*. Buenos Aires, Argentina: Cartago. 1984.

PIOTTO, D.C.; ASBAHR, F.D.F.; FURLANETTO, F.R. Significação e sentido na psicologia histórico-cultural: implicações para a educação escolar. In: *Educação escolar e a pesquisa na teoria histórico-cultural*. MOURA, M.O. (org.). São Paulo: Edições Loyola, 2017.

RIGON, A. J.; ASBAHR, F. S. F.; e MORETTI, V.D. Sobre o processo de Humanização. In.: MOURA, M. O. de. (Org.) *A atividade pedagógica na teoria Histórico-Cultural*. Brasília: Liber livro, 2010. P.13-44.

RUBTSOV, V. A atividade de aprendizado e os problemas referentes à formação do pensamento teórico dos escolares. In: GARNIER, Catherine. et. al. (Org.). *Após Vygotsky e Piaget: perspectivas social e construtivista escolas russa e ocidental*. Porto Alegre: Artes Médicas, 1996.

SANTOS, Maria Jucimeire dos. *A formação para docência em matemática: o Programa Residência Pedagógica no subprojeto de Matemática do CERES/UFRN*. Orientadora: Dra. Claudianny Amorim Noronha. 2023. 221f. Tese (Doutorado em Ensino de Ciências e Matemática) - Centro de Ciências Exatas e da Terra, Universidade Federal do Rio Grande do Norte, Natal, 2023.

SILVA, A. T. A. da. *A constituição do Clube de Matemática na UFRN como espaço formativo para a docência*. 2020. 84fls. Monografia (Graduação) – Universidade Federal do Rio Grande do Norte, Centro de Educação, Curso de Pedagogia. Natal, RN, 2020.

SILVA, M. R. *Indícios de apropriação do conceito de função por meio da aprendizagem da docência: uma proposta formativa no Clube de Matemática Ensino Médio*. 2023. Tese (Doutorado em Educação em Ciências e Matemática) – Universidade Federal de Goiás, Goiânia, 2023.

SILVA, M. M.; CEDRO, W. L. A colaboração como elemento essencial da formação do professor que ensina matemática: o caso do Clube de Matemática. *Vidya*, Santa Maria, v. 42, p. 97-114, 2022. DOI: <https://doi.org/10.37781/vidya.v42i1.4039>

ZWIRTES, A. K. *O Clube de Matemática como espaço formativo: futuros professores desenvolvendo ações de compartilhamento na organização do ensino de matemática*. 2024. Dissertação (Mestrado em Educação) – Universidade Federal de Santa Maria, Santa Maria, 2024.

Recebido: fevereiro/2026

Aprovado: maio/2026