ACTIO: Docência em Ciências
ISSN: 2525-8923

http://periodicos.utfpr.edu.br/actio

The thematic approach as a possibility for the development of critical thinking

Bruna Marques
duartebrunamd88@gmail.com
orcid.org/0000-0003-0146-7502
Secretaria do estado do Paraná de Educação (SEED), Nova Esperança, Paraná, Brasil

Luciano Carvalhais Gomes
lcgomes2@uem.br
orcid.org/0000-0002-2005-9224
Universidade Estadual de Maringá (UEM), Maringá, Paraná, Brasil

ABSTRACT

This study, grounded on the Freirean Thematic Approach and Ennis' Critical Thinking theories, analyzes how students in a rural school develop critical skills in science classes. Centered on the issue of waste, the module "Whose trash is this?" was implemented, designed by the researcher in collaboration with the school community. The activities were organized according to the Three Pedagogical Moments, promoting reflections on local practices and environmental issues. The main objective was to identify the dimensions of Critical Thinking mobilized by the students to integrate scientific knowledge and everyday experiences. Methodologically, a qualitative and interpretative approach was used in a rural school in Paraná, involving 17 students from the 7th grade. Activities such as interviews, debates, and recommendation letters highlighted skills in elementary clarification and inference, such as analyzing arguments and establishing causal relationships. The results revealed that the students demonstrated progress in their critical skills, particularly in linking causes and consequences of actions related to waste disposal. However, limitations were identified in the development of more advanced skills, such as evaluation and defining terms. From this, it is understood that the Freirean Thematic Approach, integrated into science teaching, fosters contextualized and emancipatory learning, being essential in operationalizing Critical Thinking development. However, the need to expand pedagogical strategies and public policies that promote a more equitable and transformative rural education is emphasized.
KEYWORDS: Critical Thinking; Generating Theme; Capabilities; Provisions; Rural Education.

A abordagem temática como possibilidade de desenvolvimento do pensamento crítico

RESUMO

O presente estudo, fundamentado na Abordagem Temática Freireana e nas teorias de Pensamento Crítico de Ennis, analisa como alunos de uma escola do campo desenvolvem capacidades críticas em aulas de Ciências. Com base na problemática do lixo, foi implementado o módulo “De quem é este lixo aqui?”, elaborado pela pesquisadora com a comunidade escolar. As atividades foram organizadas conforme os Três Momentos Pedagógicos, promovendo reflexões sobre práticas locais e questões ambientais. O objetivo principal foi identificar as dimensões do Pensamento Crítico mobilizadas pelos alunos para integrar saberes científicos e vivências cotidianas. Metodologicamente, utilizou-se uma abordagem qualitativa e interpretativa, em uma escola do campo do Paraná, envolvendo 17 alunos do 7º ano. As atividades, como entrevistas, debates e cartas de recomendação, destacaram habilidades de clarificação elementar e inferência, como analisar argumentos e estabelecer relações causais. Os resultados revelaram que os alunos demonstraram progresso em suas capacidades críticas, especialmente na articulação entre causas e consequências de ações relacionadas ao descarte de resíduos. Contudo, identificaram-se limitações no desenvolvimento de habilidades mais avançadas, como avaliação e definição de termos. A partir disso, entende-se que a Abordagem Temática Freireana, integrada ao ensino de Ciências, fomenta aprendizagens contextualizadas e emancipatórias, sendo essencial em operacionalizações para o desenvolvimento do Pensamento Crítico. Entretanto, reforça-se a necessidade de ampliar estratégias pedagógicas e políticas públicas que promovam uma educação do campo mais equitativa e transformadora.

PALAVRAS-CHAVE: Pensamento Crítico; Tema Gerador; Capacidades; Disposições; Educação do Campo.

INTRODUCTION

According to Paulo Freire (2018), banking education is criticized for being teaching process in which the teacher assumes the exclusive role of narrator, transferring fragmented content to students, which makes them passive in their learning. This model disconnects educacional content from its contextual meaning, limiting the capacity for critical reflection. In science teaching, this approach often translates into practices that emphasize the memorization of concepts, neglecting their relevance to the understanding of the social dynamics that shape scientific knowledge.

Considering the challenges faced by formal education, particularly within the context of Rural Education, this study is based on critical perspectives that integrate school knowledge with the life experiences and collective demands of students. Thus, based on the Freirean Thematic Approach and the promotion of Critical Thinking, a contextualized scientific education is proposed, which values the cultural and social knowledge of the students, aiming to foster meaningful and transformative learning processes.

In this context, this paper presents the results of the analysis of the application of the module entitled “Whose garbage is this here?”, part of a Thematic Unit elaborated and implemented by the first author of this study. The objective of the module was to develop skills related to Critical Thinking, taking as a starting point the Generating Theme "garbage", identified through dialogue with the school community. To this end, the proposal was grounded on the Freirean Thematic Approach (Silva, 2004) and developed from the Three Pedagogical Moments, as described by Delizoicov, Angotti and Pernambuco (2007), in addition to being aligned with the assumptions of authors such as Ennis (1985) and Tenreiro-Vieira and Vieira (2019, 2021), who emphasize the importance of fostering skills, dispositions and values linked to Critical Thinking.

Based on the implementation of this module, this article seeks to answer the following question: What dimensions of Critical Thinking are mobilized by students in a rural school when engaging in Science classes based on a Freirean Thematic Approach? To this end, the study sets out the following objectives: to identify how this approach contributes to the development of Critical Thinking from the investigation of Generating Themes in the school community; analyze the development of the module of the Thematic Unit; and to identify the dimensions of Critical Thinking mobilized by the students.

Thus, this study reinforces the importance of a Science Education that dialogues with the reality of students, values their local knowledge and prepares them to face complex issues, such as sustainability, public policies and collective health. Thus, the research presented here, by proposing a discussion centered on the problem of garbage, seeks not only to mobilize students' Critical Thinking, but also to contribute to the strengthening of a critical and democratic education. It is a proposal aligned with the appreciation of the cultural identity and the socio-environmental reality of the rural school.

THEMATIC APPROACH AND CRITICAL THINKING ALIGNED IN THE CONSTRUCTION OF AN EMANCIPATORY RURAL EDUCATION

The formation of Rural Education in Brazil emerges within a context characterized by the need to overcome the history of exclusion imposed by the dominant elites on rural populations. For a long time, the formal education offered to rural communities was restricted to specific actions, such as literacy programs, extension courses and technical assistance, reflecting an educational model dissociated from the needs and specificities of these populations (Arroyo, Caldart & Molina, 2008). However, from the mobilization of social movements, such as the Landless Workers' Movement (MST), and initiatives such as the National Program for Education in Agrarian Reform (PRONERA), Rural Education has consolidated itself as both a political and epistemological demand, configuring itself as a strategic space for social struggle and the affirmation of rights (Silva & Ortiz, 2013).

Situated within this context of resistance and transformation, the rural school faces obstacles that compromise the effectiveness of the educational process. Fernandes, Cerioli and Caldart (2011) highlight, among the main challenges, the absence of teacher qualification, the precariousness of the school infrastructure and the imposition of a "curriculum and calendar alien to the reality of the countryside" (p. 39). These factors accentuate the urgency of adopting pedagogical practices aligned with the experiences and needs of rural communities, in order to promote a contextualized and socially meaningful education.

In the face of these adversities, the Freirean Thematic Approach presents itself as a powerful pedagogical proposal. Based on dialogue, problematization and the collective construction of knowledge based on the students' reality, this perspective offers a solid theoretical basis to transform the rural school into an emancipatory space, in which the student is able to "[...] learning to learn by learning the reason for the existence of the object or content" (Freire, 1992, p. 10).

At this juncture, dialogue, a structuring element of the Thematic Approach, is an essential strategy to expand critical reflection in the learning process. Organized around the Generating Themes, this dialogue emerges from the so-called limit situations, that is, from oppressive conditions that restrict the freedom and critical development of individuals (Freire, 2018). Such situations, deeply rooted in the social, economic and political dimensions, maintain structures of domination that make it difficult for the oppressed to recognize their own capacity for transformation.

When examined in the light of systematized scientific knowledge, the Generating Themes, anchored in the concrete experiences of the subjects, promote a dialectical movement that enhances the critical understanding of reality. In this way, they challenge common sense and invite students to reconstruct their trajectories based on a liberating educational process.

Overcoming these barriers enables the integration between local knowledge and universal scientific knowledge, favoring a critical reading of the world. As Mili, Almeida and Gehlen (2018) state, starting from the Generating Themes requires an educational construction that transcends fragmentation, promoting a deep reflection that goes beyond the immediate limitations of the context. In this sense, the Freirean Thematic Approach contributes to articulate knowledge in order to

expand the critical and contextualized training of students, enabling a more integrated and comprehensive understanding of reality.

Based on this conception, the application of the Freirean Thematic Approach in rural schools becomes even more relevant, as it allows school content to be intrinsically connected to local realities, overcoming the limitations of a curriculum often disconnected from the specificities of rural life. Freire (2018) argues that the educational process should start from the needs and challenges experienced by the subjects, ensuring that learning is built collectively, in partnership with the community. For him, the analysis of the Generating Themes requires a critical reading that enables the exploration of different approaches to the same fact, favoring the development of critical thinking and allowing the subject to interact with society in an active, conscious and transformative way.

Based on this principle, the study of the Generating Themes can be applied in the classroom through the organization of activities based on the Three Pedagogical Moments. This alignment is a fundamental strategy for the promotion of Critical Thinking, as it encourages students to carry out in-depth analysis, argue based on evidence and make informed decisions.

In this sense, understanding the structure and intentionality of the Three Pedagogical Moments becomes essential for its application in educational practices aimed at the development of Critical Thinking. Elaborated by Delizoicov, Angotti and Pernambuco (2007), this methodological proposal aims to guide the planning and execution of classroom activities, organizing the educational process in three interdependent stages: the initial problematization, the organization of knowledge and the application of knowledge. This structure constitutes a robust pedagogical approach, in which the interdependence between the stages expresses the dialectical nature of the proposal; Each moment, in turn, prepares the ground for the next, promoting a continuous flow of learning that favors the construction of knowledge in a meaningful and contextualized grounded manner.

In the initial problematization, real issues or situations with which the students identify and that are directly related to the topics of study are presented. This moment is fundamental because it allows students to share their previous ideas and understandings, which guides the teacher on the starting point of learning. In the organization of knowledge, according to Muenchen and Delizoicov (2014), the focus falls on the construction of essential knowledge to understand the topic addressed, always with the mediation of the educator, who guides students in the systematization of this knowledge.

The application of knowledge, in turn, is the stage in which the systematized contents are re-elaborated and used to explain both the initial problems and new situations. At this point, learning expands beyond the examples studied, allowing students to extrapolate the content and apply it to new realities, consolidating their understanding. The teacher plays an active role in proposing activities that encourage the mobilization of knowledge, ensuring that students put it into practice in a meaningful way (Muenchen & Delizoicov, 2014).

In this way, the last stage of the Three Pedagogical Moments, the application of knowledge, as well as the previous ones, is aligned with the promotion of Critical Thinking, since it stimulates in-depth reflection, reasoned argumentation and decision-making in the face of new situations. To enhance dialogic teaching

through the division of the class into moments, it is necessary to integrate the development of Critical Thinking into the educational process, which, according to Duarte, Ribeiro and Gomes (2023, p. 270), "[...] it is placed as effective for the understanding of various issues; Thus, an education that has the presuppositions for its orientation is necessary." From this perspective, the teaching action aimed at promoting Critical Thinking must be intentional and explicit, a conception also reinforced by Tenreiro-Vieira and Vieira (2019).

With this in mind, in schools, the teaching work, the organization of materials and the conduction of activities can be guided through taxonomies aimed at the development of Critical Thinking. Among the scholars who contributed significantly to this perspective, Robert Hugh Ennis, considered one of the most influential theorists on the subject in the area of education, stands out (Tenreiro-Vieira & Vieira, 2000).

According to Ennis (1985), Critical Thinking encompasses a set of essential skills, organized into distinct categories. Among them, skills related to clarity; inference skills, aimed at establishing solid bases for conclusions; and those aimed at structured and effective decision-making, often associated with problem solving. When these skills are articulated with dispositions favorable to reflective thinking, they form a comprehensive process that guides the individual in choosing what to believe or do.

Based on this conception, Ennis (1985) developed a taxonomy to verify and evaluate the dispositions and capacities related to Critical Thinking. This taxonomy is organized into two broad categories: dispositions and capabilities, and can be applied in curriculum design, teaching, and skills assessment.

The category of dispositions encompasses affective aspects that are essential for the individual to be able to make decisions in a conscious and reasoned manner, both in relation to what they believe and the actions they choose to take. Among these dispositions, we can mention: looking for reasons, looking for alternatives, having an open mind, among others.

The category of capabilities, on the other hand, is organized into five main areas: elementary clarification, basic support, inference, elaborate clarification, and strategies and tactics. Each of these areas is made up of capacities and their descriptors, which specify the essential skills for the improvement of Critical Thinking.

In each domain of Critical Thinking, descriptors function as identifiers of capacities. Thus, for example, if a student is able to: "a) Identify conclusions; b) Identify reasons stated; c) Identify reasons not stated; d) Identify similarities and differences; e) Identify and deal with irrelevancies", in addition to: "f) Seek the structure of an argument; g) Summarize" (Santos, 2018, p. 52), this indicates that he is employing argumentative strategies (ability described in the area of elementary clarification), being able to evaluate arguments and compare them with his own.

Considering these parameters, the activities elaborated in the Thematic Unit described by this work follow the assumptions of Ennis' taxonomy (1985), with regard to the orientation and explanation of Critical Thinking. In relation to the Freirean Thematic Approach employed in the process of surveying the Generated

Themes and the organization of the unit from the Three Pedagogical Moments, it is conjectured that this configuration is capable of promoting the construction of knowledge from the reality and experiences of the students, providing an environment that favors the development of the cognitive capacities of Critical Thinking, such as the clarification of ideas, inference and evidence-based decision-making. In this sense, the teacher's performance moves away from a transmissive approach and is oriented towards a practice that encourages students to critically analyze their reality and seek solutions to the challenges they face, promoting a continuous process of emancipation.

METHODOLOGY

This study was conducted based on a qualitative methodology, grounded in an interpretative and descriptive approach (Miranda, 2009; Gil, 2010). This choice is justified by the relevance of the investigative process in verifying the educational phenomena under analysis, in line with the objective of capturing the specificities of the educational context in question (Moraes, 2003). From this perspective, the research prioritized a rigorous and careful analysis of the information collected, seeking relevant understandings about the reality investigated

The context of the research was the State School of Campo Barão de Lucena, located in the district of Barão de Lucena, municipality of Nova Esperança-PR. The data were collected by the class teacher, who also worked as a researcher and has worked at the institution since 2015.

For the development of the research, an immersion in the school daily life was carried out, and the survey of the Generating Themes occurred in seven stages, following the guidelines proposed by Silva (2004). In the first stage, the relationships between students, teachers, employees of the institution and the structure of the place were analyzed. In the second, the students were questioned about the community, asking them to express their opinions about the district in which they live and the school they attend, in addition to identifying the main problems in the surroundings, listing those they would like to discuss at school. Among the aspects reported, the lack of job opportunities, water scarcity, absence of places for leisure and incorrect disposal of garbage stood out.

In the next phase, an informal conversation was established with the community, at which time photographs of the district and the areas near the school were recorded, allowing us to observe the inadequate disposal of waste. The population, in turn, expressed concern about the lack of water supply and the deficiency in transportation, points that converged with the students' mentions.

In the fourth stage, discussions were held with the school's teachers about the possible themes to be addressed, considering the context of the field and the information previously gathered. This process was developed in dialogue with teachers from different areas, Art, English, Physical Education and Mathematics, who highlighted the importance of dealing with collective health issues, such as Covid-19 and dengue, and themes related to the appreciation of the countryside.

In the fifth stage, the dialogue took place with the community and the students, regarding the previously selected situations. At this time, the students were asked about their opinions on topics such as the lack of water, collective

health concerns, the devaluation of work in the field, transportation between the district of Barão de Lucena and the municipality of Nova Esperança, in addition to waste disposal. During the classes, they were also asked about the subjects they would like to study and the problems they recognized in their community, and it was found that many showed interest in knowing the agricultural production of crops present in their reality, such as soybeans, cassava and grapes, among others.

Based on the responses obtained, the sixth stage identified the main themes: the lack of water, the devaluation of work in the field and the inadequate disposal of waste. During the Thematic Reduction, a dialogue was held with the institution's teachers to define which contents would be treated, considering the knowledge pertinent to the investigative stage

Considering the contributions of the professors and the researcher/professor, other subjects were also introduced, related to the main themes, called "hinge themes" (Freire, 2018), such as collective health issues and the use of pesticides and fertilizers in agriculture.

In the seventh and final stage, three Thematic Units were built, involving the Generating Themes: work, garbage and collective health. However, for this study, only one of the modules of the Unit entitled Our daily garbage was analyzed, which addresses the issue of garbage in the community.

The Thematic Unit was developed with a focus on the curricular component of Science, applied to the 7th grade class, composed of 17 students. Based on the principles of the Freirean Thematic Approach, it was sought to foster Critical Thinking through the connection between school content and the socioeconomic reality of the countryside. The activities promoted discussions that articulated scientific knowledge to the daily experience of students and their families, strengthening the bond between school and community.

All participants were previously informed about the objectives and procedures of the research. Ethical compliance was ensured through the approval of the Research Ethics Committee (COPEP), under protocol No. 098458/2020. Informed Consent Forms were given to the parents or guardians and students, ensuring that only those duly authorized would participate in the study. This step reinforced transparency and ethics in the collection and analysis of data.

The application of the Thematic Unit, which included the module analyzed, entitled Whose garbage is this here?, took place during the Science classes. The module lasted 4 class hours and aimed to promote dialogue with students and the community about the problem of incorrect waste disposal. Its organization was based on the Three Pedagogical Moments and its execution was planned to develop Critical Thinking, using strategies formulated based on the capacities described by Ennis (1985) in his taxonomy.

The module began with a problematization based on the statement of one of the participants of the thematic survey: Everyone throws candy wrapper on the ground, but it doesn't count. Based on this statement, questions were proposed that stimulated critical reflections, with the aim of mobilizing capacities related to elementary clarification and inference, according to Ennis' taxonomy (1985).

In the second moment of the module, dedicated to the organization of knowledge, it was proposed to conduct an interview within the school community,

aiming to develop the observation capacity related to the area of Basic Support. In the phase of application of knowledge, questions were asked and the elaboration of a letter of recommendation was proposed, activities that required the mobilization of various Critical Thinking skills, according to Ennis (1985).

Ennis' (1985) taxonomy grounded the construction, application and analysis of the Thematic Units, guiding the elaboration of the checklist used in the documentary analysis of the materials worked by the teacher/researcher. Its clear and easy-to-apply structure allowed the list items to be aligned with the thinking skills described, ensuring coherence in the evaluation process.

For the analysis of the collected data, the written answers of the students in their thematic notebooks were verified, in addition to the evaluation of the recorded videos and the notes made in the field diary, in order to identify signs of mobilization of Critical Thinking capacities.

The Content Analysis proposed by Bardin (2016) was adopted, which provided a consistent methodological basis for the analysis of the students' responses, organized into five categories: (1) Mobilized the required capacity; (2) Mobilized other capacity, in addition to the one required; (3) It did not mobilize; (4) Partially mobilised the required capacities; (5) Mobilised another capacity.

In the next section, excerpts identified by symbols that represent their sources are presented: the students' speeches and writings, obtained through the videos, were represented by the letter "A" followed by the corresponding number (A1, A2, A3,..., A17).

FINDINGS

By examining the characteristics of problematization within the scope of the Three Pedagogical Moments, this stage is recognized as an opportunity to understand the students' perceptions of the topics addressed, to identify limitations and contradictions in their understandings, in addition to outlining the necessary interventions for the development of the second moment (Delizoicov, Angotti & Pernambuco, 2007). It is, therefore, a phase conducive to the mobilization of capacities related to the analysis of initial arguments and the formulation of possible problems.

In this context, the analysis of the results reveals that, in the First Pedagogical Moment, the area of elementary clarification was intentionally mobilized, through questions that stimulated students to reflect on everyday situations and to argue about their positions. An example of this approach can be seen in the following excerpt: *Everyone throws candy wrapper on the ground, but it doesn't count.* Faced with this provocation, the students were invited to take a stand. Of the 17 (seventeen) participants, only 2 (two) did not mobilize the capacity associated with the analysis of arguments, because they were unable to express their opinion or present justifications for their choice.

This activity, which included the question: *Do you agree or disagree with this statement? Comment*, related to the statement highlighted in the previous paragraph, provided a moment of reflection on the topic of "garbage". During this stage, the students were encouraged to analyze their own attitudes, as

demonstrated by the statement of participant A17: *I agree, because we do not think about what can happen, but we must assume our mistake*. From this response and the general involvement of the class, it is possible to perceive that the educational process can constitute an opportunity for the recognition of extreme situations and for the collective construction of ways to overcome them. The student's position reveals a predisposition to critical reflection on their actions, evidencing the emancipatory potential of the pedagogical practice adopted.

In view of this, it is argued that considering the dispositions in the process of constructing Critical Thinking is a fundamental pedagogical decision. As Tishman, Perkins and Jay (1999) point out, such dispositions differentiate good thinking from average thinking, as good thinkers tend to clarify their reasoning, seek solid arguments, use criteria and organize their ideas in a logical way.

During the analysis of the First Pedagogical Moment, it was observed that the capacity for inference was less mobilized, possibly because it requires previous knowledge that allows identifying similarities, raising hypotheses and formulating causal explanations, skills that students are still in the process of developing. This finding highlights the potential of problematization as a favorable space for the mobilization of Critical Thinking descriptors, such as the survey of facts, the analysis of the justifications presented and the investigative focus. Thus, the predominance of elementary clarification in this first moment of pedagogical practice is justified.

The Second Pedagogical Moment, called knowledge organization, corresponds to the phase in which essential information is identified and structured for the understanding of the theme and the initial problematization (Delizoicov & Angotti, 1990). At this time, activities described in Chart 2 were developed, including the proposal to conduct an interview with members of the community.

The interview activity, in particular, not only mobilized various cognitive capacities, but also contributed significantly to the construction of knowledge about the proper disposal of materials. Based on the report of a dentist, the students learned about technical aspects about the disposal of infectious waste, such as the appropriate place for deposit, the collection protocols and the risks associated with contact with biological materials, including HIV infections and hepatitis B and C. These contents were later deepened in the classroom, with the mediation of the teacher, which clarified the concept of infection and the main characteristics of viral diseases.

In this circumstance, it is observed that the activity of interviewing, combined with exploratory research, composes a set of pedagogical strategies that favor the development of dispositions and capacities linked to Critical Thinking, as described by Ennis (1985). Such strategies provided significant moments of construction of knowledge, skills, attitudes and values, preparing students to act consciously and responsibly in different social situations.

In addition, the interview required the exercise of elementary clarification, since the students needed to evaluate different points of view on garbage disposal in the community. From this analysis, they were encouraged to make inferences based on the data obtained, which were organized in a comparative table with the objective of identifying similarities and differences between the answers of the

interviewees. This stage is directly related to the capabilities of the inference area, evidencing the formative potential of the proposal.

Among the 17 (seventeen) participating students, 15 (fifteen) were able to point out a similarity, while only 7 (seven) identified a difference between the answers of the interviewees. This data suggests a greater difficulty in perceiving divergences, possibly due to the variety of answers obtained. The similarities were, for the most part, related to concern for the environment; On the other hand, the differences varied according to the profile of the interviewees, especially their area of professional activity. To illustrate this issue, the case of two health professionals interviewed stands out. Asked about the relationship between garbage disposal and environmental preservation, one of them addressed the destination of infectious waste, while the other mentioned the care with the disposal of sharp materials, such as glass shards, which, when disposed of improperly, harm the recycling process. Regarding the perception of differences, participant A4 stated: *Because there is a lot of difference between the community; However, he was unable to specify what those distinctions would be.*

It is noteworthy that, in relation to the capacities of the area of elementary clarification, these were evidenced in several pedagogical moments, even when the intentionality of the proposal was focused on the development of inference. This occurred, for example, in question-based activities that asked students to formulate explanatory hypotheses. Faced with the question: In your view, why do people throw garbage on the ground?, it was observed that 10 (ten) of the 16 (sixteen) respondents presented examples of causes for the behavior in question. As a result, they predominantly mobilized the ability to exemplify, rather than fully activate, the skills associated with inference.

From the above, it is highlighted that the activities proposed in the Second Pedagogical Moment were based on observation and comparison of arguments as a deepening strategy. This process favored the development of skills linked to Critical Thinking, especially in the areas of elementary clarification and basic support, which involve the observation and recording of facts, skills made possible by direct contact with the community, through interviews.

The Third Pedagogical Moment aims to systematize the knowledge acquired by the students, allowing them to analyze and interpret both the situations that motivated the study and others, although not directly related, but which can be understood through the same theoretical framework (Delizoicov, Angotti & Pernambuco, 2007). This becomes especially evident in the activities based on Generating Themes, which dialogue with the reality experienced by the students. Thus, it seeks to encourage student engagement in the application of concepts in real contexts, going beyond the logic of mechanical resolution of school exercises.

Based on this principle, we proposed the following activity: *Suppose that you, as the school principal, decided to go to the classrooms to draw attention to the incorrect disposal of waste in the courtyard. Elaborate a speech addressing this attitude and its consequences*. This task required the ability to argue, specifically associated with the search for the structure of an argument. However, only 7 (seven) of the 14 (fourteen) respondents demonstrated this competence. This difficulty may be related to the fact that the predicted elementary capacity was

treated only as a support for a more complex one, which, because it was not presented explicitly, ended up not being activated by the students.

The capacity associated with elementary clarification, in turn, was evidenced in the activity he proposed: *Imagine that you are in a place where there are no trash cans. And it consumes a candy. What would be a good example in this situation? Which would not be a good example?.* Although this activity required a conceptual analysis, only 9 (nine) of the 17 (seventeen) participants were able to present examples of correct and incorrect attitudes towards garbage disposal.

Regarding the area of inference, a greater mobilization of the ability to induce hypotheses was observed when associated with elementary clarification, as evidenced in the answer to the question: *In your view, why do people throw garbage on the ground?.* In this situation, the students, instead of formulating hypotheses, presented examples. On the other hand, when the question was formulated: *How can the act of throwing candy wrapper on the ground affect the environment?,* which required an inferential answer, 10 (ten) of the 16 (sixteen) students formulated explanatory hypotheses, articulating specific knowledge in their conclusions.

Regarding the clarification elaborated, the same activity also generated more in-depth responses. Most students presented adequate and inadequate examples; four mobilized the predicted descriptors, and three extrapolated, demonstrating the ability to judge. For example, the excerpt from the answer to A1 stands out: *The paper should be kept in a bag or in a pocket so as not to be discarded on the floor. And when you get home, dispose of it in the recyclable garbage. But, if you don't have a pocket or purse, go into a place with a trash can and dispose of the paper there.*

An especially significant activity was the *Letter of Recommendation*, which invited students to reflect on the problem of garbage both at school and in the community. This proposal, as well as the interview, required skills related to communication, empathy and attentive listening, in addition to favoring autonomous and creative expression. The excerpts below show these dimensions:

A8 - Councillor,

I come through this letter to ask you to place a specific place, on rural roads, to collect once or twice a month the garbage from the farms [...].

A14 - Dear Grandfather,

I am sending this letter to you to help you with the correct disposal of garbage. Garbage cannot be burned, it must be disposed of in the correct place [...] Garbage also cannot be thrown on the street, as it pollutes the environment and harms our health. Therefore, we must throw the right garbage, so take care of our society.

A16 - To all of us,

We will kill the world if we don't stop. Each one has to pick up their garbage to help the world and animals and us too. Otherwise, where will we end up? We need to think more about what we are doing.

Through these productions, it is possible to see that the students reflected on broader social issues, such as political action and collective responsibility. In addition, they demonstrated ethical sensitivity and willingness to rethink everyday

attitudes. The movement of reflection on oneself and on the other was, therefore, enhanced by the contextualization of the Generating Themes (Freire, 2018), which provided concrete opportunities for critical appropriation of knowledge.

FINAL CONSIDERATIONS

The present study sought to answer the question: *What dimensions of Critical Thinking are mobilized by students from a rural school when engaging in Science classes elaborated from a Freirean Thematic Approach?* In this context, this work reinforces the relevance of integrating the assumptions of the Freirean Thematic Approach to the teaching of Science, especially in the context of Rural Education, where challenges such as the absence of contextualized curricula and inadequate infrastructure persist. The study showed that pedagogical practices that promote dialogue, problematization and critical reflection can contribute significantly to the strengthening of a critical and emancipatory scientific education.

The Freirean Thematic Approach is characterized by the debate of knowledge for the understanding of reality. It should be noted that the concepts studied refer to the seventh year; However, the themes that were listed for analysis arose in the face of the problem experienced and not only obeying what was proposed by the curriculum. Thus, the orientation of critical thinking, combined with a contextualized approach, is relevant in educational contexts that can be rigid and uncritical.

Regarding the Critical Thinking skills, it is identified that some of them were more mobilized by the students during the activities proposed in the module entitled *Whose garbage is this here?,* which addressed environmental issues. Among these, the skills related to elementary clarification stand out, in questions in which students should demonstrate arguments, present examples, among other points. The inference was required and presented when it was observed that the students mobilized the ability to infer, explain, connecting causes and consequences based on their knowledge and experiences. The answer of one of the participants illustrates this: *A1-Candy paper takes time to decompose and harms the environment, so it cannot throw candy wrapper on the ground*. This type of reflection evidences progress in the development of the ability to analyze causal relationships and infer consequences.

However, the capacities related to strategy formulation, such as decision-making and the evaluation of alternatives, were less mobilized throughout the activities. However, they became more evident in proposals that required planning and communicating solutions, such as in the drafting of a letter of recommendation. In general, the capacities most evidenced in the study were those linked to elementary clarification and inference, which reflects the role of structured activities in promoting analysis and reflection on everyday situations. On the other hand, the areas of basic support, elaborate clarification and tactical strategies still require greater attention, in order to ensure a more balanced development of the various dimensions of Critical Thinking. This finding reinforces the need to diversify pedagogical practices and to offer continuous support to students in the process of building these capacities.

Despite the relevant contributions, this study has some limitations. The research was conducted in a single school context and addressed a specific theme, which restricts the possibility of generalizing the results. In addition, the time allocated to the application of the activities may have been insufficient to explore all the pedagogical potentialities offered by the Three Pedagogical Moments. It was also observed that students have greater difficulty in mobilizing skills related to inference and elaborated clarification, which suggests the need to deepen didactic strategies that favor the development of these skills.

The continuity of this educational process requires an intentional commitment on the part of educators and educational institutions in order to overcome the models of banking education, often still prevalent, which direct students to be passive recipients of information. The development of Critical Thinking, combined with the Freirean Thematic Approach, not only challenges this logic, but also promotes the formation of independent and conscious subjects.

By adopting pedagogical practices that start from the students' reality, such as working with Generating Themes, educators can integrate school content with relevant social, cultural and environmental problems. This contributes to a transformative education that dialogues with the specificities of the field and values the diversity of knowledge. In addition, the systematization of the Three Pedagogical Moments proved to be a powerful tool for planning, executing and evaluating pedagogical practices that involve students in reflective and investigative processes, promoting the mobilization of cognitive capacities and dispositions.

However, it is essential that the impact of these approaches be expanded through public policies that prioritize teacher qualification, the improvement of the structural conditions of rural schools, and the creation of teaching materials that reflect the reality of these communities. This reinforces the idea that a critical and transformative education cannot be an isolated effort; It must be supported by collective and institutional actions that guarantee equity and access to quality education.

Therefore, in a global context marked by inequalities and socio-environmental crises, the development of Critical Thinking in students is not only a pedagogical objective, but an urgent need for the construction of a fairer and more sustainable society. We conclude that this study, by highlighting the potentials and challenges of the Freirean Thematic Approach and Critical Thinking in Science teaching, offers a basis for future reflections and actions aimed at strengthening Rural Education as a space of resistance, emancipation and social transformation.

REFERENCES

Bardin, L. (2016). *Análise de conteúdo*. Edições 70.

Delizoicov, D., & Angotti, J. A. (1990). *Física*. Cortez.

Delizoicov, D., Angotti, J. A., & Pernambuco, M. M. (2007). *Ensino de ciências: Fundamentos e métodos*. Cortez.

Duarte, B. M., Ribeiro, R. G. T., & Carvalhais, L. G. (2023). Pensamiento crítico y fundamentos epstemológicos: ¿Cómo se influyen? *Paradigma, 44*(1), 368–386.

Ennis, R. H. (1985). A logical basis for measuring critical thinking skills. *Educational Leadership, 43*(2), 44–48.

Freire, P. (1992). *Pedagogia da esperança: Um reencontro com a Pedagogia do oprimido* (7ª ed.). Paz & Terra.

Freire, P. (2018). *Pedagogia do oprimido* (65ª ed.). Paz & Terra.

Gil, A. C. (2010). *Como elaborar projetos de pesquisa* (5ª ed.). Atlas.

Milli, J. C. L., Almeida, E. dos S., & Gehlen, S. T. (2018). A rede temática e o ciclo temático na busca pela cultura de participação na educação CTS. *Alexandria: Revista de Educação em Ciência e Tecnologia, 11*(1), 71–100.

Miranda, R. J. P. (2009). *Qual a relação entre o pensamento crítico e a aprendizagem de conteúdos de ciências por via experimental? Um estudo do 1° ciclo* [Dissertação de mestrado, Universidade de Lisboa].

Moraes, R. (2003). Uma tempestade de luz: A compreensão possibilitada pela análise textual discursiva. *Ciência & Educação (Bauru), 9*(2), 191–211.

Muenchen, C. (2006). *Configurações curriculares mediante o enfoque CTS: Desafios a serem enfrentados na EJA* [Dissertação de mestrado, Universidade Federal de Santa Maria].

Muenchen, C., & Delizoicov, D. (2014). Os três momentos pedagógicos e o contexto de produção do livro "Física". *Ciência & Educação (Bauru), 20*(3), 617–638.

Santos, F. C. (2018). *Atividades investigativas e história da ciência: Tendências em potencial para promover o pensamento crítico* [Dissertação de mestrado, Universidade Federal de Sergipe].

Silva, A. F. G. (2004). *A construção do currículo na perspectiva popular crítica: Das falas significativas às práticas contextualizadas* [Tese de doutorado, Pontifícia Universidade Católica de São Paulo].

Silva, M. R. D., & Ortiz, N. L. F. (2013). A educação do campo no contexto histórico: Algumas reflexões. In *I Seminário Regional de Educação do Campo: Projetos políticos pedagógicos das escolas do campo* (pp. 1–10). UFSM.

Tenreiro-Vieira, C., & Vieira, R. M. (2000). *Promover o pensamento crítico nos alunos: Propostas concretas para sala de aula* (10ª ed.). Porto Editora.

Tenreiro-Vieira, C., & Vieira, R. (2029). Promover o pensamento crítico em ciências na escolaridade básica: Propostas e desafios. *Revista Latinoamericana de Estudios Educativos, 15*(1), 36–49.

Tenreiro-Vieira, C., & Vieira, R. M. (2021). Promover o pensamento crítico e criativo no ensino das ciências: Propostas didáticas e seus contributos em alunos portugueses. *Investigações em Ensino de Ciências, 26*(1), 70–84.

Received: Dec. 20, 2024
Approved: Apr. 29, 2025
DOI: https://doi.org/10.3895/actio.v10n2.19718

How to cite:
Marques, B. & Gomes, L. C. (2025). The thematic approach as a possibility for the development of critical thinking. ***ACTIO***, 10(2), 1-17. https://doi.org/10.3895/actio.v10n2.19718

Address:
Bruna Marques Duarte
Rua Peres Uchoa n. 258, Centro, Nova Esperança, Paraná, Brasil.

Recebido: 20 dez. 2024
Aprovado: 29 abr. 2025
DOI: https://doi.org/10.3895/actio.v10n2.19718

Como citar:
Marques, B. & Gomes, L. C. (2025). A abordagem temática como possibilidade de desenvolvimento do pensamento crítico. ***ACTIO***, 10(2), 1-17. https://doi.org/10.3895/actio.v10n2.19718

Correspondência:
Bruna Marques Duarte
Rua Peres Uchoa n. 258, Centro, Nova Esperança, Paraná, Brasil.