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Creative Insubordination in the Continuing Education of Teachers Who Teach Mathematics in the Early Years: A Study with Teachers Participating in a Research Group

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ABSTRACT

Continuing teacher education represents a significant moment of rupture, allowing for reflection on traditional pedagogical practices. Therefore, we question: how does Creative Insubordination (CI) influence the change in posture of teachers who teach mathematics in the early years of elementary school during continuing education? The objective of this study is to analyze the influence of Creative Insubordination on the change in posture of teachers who teach mathematics in the early years of elementary school during continuing education. It is a qualitative study, aiming to discuss CI with teachers who are members of the Research and Study Group Weaving Cognitive Learning Networks (G-TERCOA/CPNq/UFC). For data collection, we sent a questionnaire with open-ended questions via Google Forms. The questionnaire data were analyzed according to the Fedathi Sequence as a Methodology for Data Analysis (SFMAD), based on four sub-phases: curation, detail, presentation, and interpretation. The research demonstrates that the continuing education of mathematics teachers faces the challenge of fostering innovative-collaborative pedagogical practices, highlighting IC (Innovative Communication) as a relevant concept for promoting teacher autonomy and critical reflection. We conclude that continuing education makes it possible to overcome traditional pedagogical practices, such as institutional resistance and pressure for standardized results. Thus, it is necessary to be creatively insubordinate to implement significant changes in the educational context. The study suggests that continuing teacher education could more systematically incorporate the principles of Creative Insubordination, promoting critical, creative, and innovative-collaborative pedagogical practices in order to strengthen the emancipatory role of teaching.

Keywords: Creative Insubordination, Continuing Education, Mathematics Teaching

INTRODUCTION

The Study and Research Group Weaving Cognitive Learning Networks (G-TERCOA/CNPq/UFC) is a formative space focused on theories, methodologies, and concepts, such as Creative Insubordination (CI). The Group is not limited to the articulation of content, as it has repercussions on the preparation of its members for insertion into the school environment, consolidating itself as a space for continuous and ongoing training (Sousa Neta, et al. 2025).

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The continuing education of teachers who teach Mathematics in the early years constitutes a relevant moment for reflection on pedagogical practices that involve dialogues based on contemporary challenges in Education. We can consider that training focused on teaching Mathematics goes beyond obtaining specific qualifications that enable them to work in classroom environments, with possibilities that transcend a conventional pedagogical approach (Prata, 2023). Traditionally marked by content-based approaches, this training tends to reproduce conservative pedagogical models, distant from the sociocultural complexities that permeate the classroom. For Bezerra (2023), the teacher presents a relational discourse, but in practice they teach in the way they learned during their initial training. We emphasize that we are in constant technological change, with new practices, discoveries and challenges. Due to this, continuing and permanent training complements the gaps in initial training, in order to not only keep professionals updated in their area, but in constant transformation. Freire (1987) addresses the idea of human incompleteness by stating that, as human beings, we remain unfinished throughout life, implying a constant becoming. Therefore, it is essential to invest in the continuing education of teachers in order to rethink their practices in the face of the challenges of the 21st century, in which we can cite the implementation of digital technologies and/or innovative-collaborative practices (Scipião, 2024).

Innovative-collaborative practices involve both systematized knowledge and didactic-pedagogical knowledge in the elaboration and reformulation of diversified pedagogical practices and dialogical processes, with or without the support of digital technologies that serve the subject in an integral way. However, digital tools act as support and complement to teaching practice, responding to the needs of students and the demands of contemporary education (Scipião, 2024).

In this context, the notion of Creative Insubordination (CI) emerges as an innovative and critical perspective, which seeks to break with hegemonic paradigms by proposing ethical and political actions in teaching practice (D'Ambrósio & Lopes, 2015). Far from signifying a mere inconsequential rupture, CI proposes a conscious engagement of innovative-collaborative practices, capable of re-signifying the teaching of Mathematics in search of changes in the teaching posture (Scipião, 2024).

The notion of CI emerges as an innovative-collaborative (Scipião, 2024) and critical proposal, seeking to break with a posture that does not allow for other ways of teaching and learning. However, above all, it is essential that the teacher is willing to promote changes, which generates challenges and raises questions related to power dynamics, both in the pedagogical field and, especially, in the political field.

Understanding how these changes can transform pedagogical practices and promote a more critical and reflective teacher training prompts the research problem under study: how does Creative Insubordination influence changes in the attitudes of teachers of mathematics in the early years of elementary school during continuing education? Thus, this study aims to analyze the influence of Creative Insubordination on changes in the attitudes of teachers of mathematics in the early years of elementary school during continuing education. We emphasize that the mathematics of the early years discussed in the text refers to the first stage of Elementary Education, as established by the National Common Curriculum Base (BNCC) (Brazil, 2017), covering the 1st to 5th years of Basic Education with the expected age range of

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6 to 10 years. This phase aims to ensure the integral development of students, promoting literacy, the construction of essential knowledge, and the development of cognitive, social, and emotional skills, as well as the formation of values.

Although recent studies highlight the importance of IC for attitude change, we observe a gap in innovative-collaborative pedagogical practices, especially in the context of continuing education for teachers of mathematics in the early years. Given this, this study is relevant because it addresses the continuing education of mathematics teachers as an essential process for rethinking pedagogical practices in the face of contemporary educational challenges. We reflect on teacher training beyond the acquisition of specific qualifications, seeking to transform traditional, conservative methods, often distant from students' sociocultural realities, into contextualized practices. The methodology adopted in the research is presented next, followed by the results and their discussion, and finally by the conclusions.

RESEARCH METHOD

The methodology was organized to align with the study's objectives, thereby promoting their achievement by fostering awareness of the concept of IC through theoretical discussions, collective reflections, and the problematization of everyday school situations, allowing teachers to recognize and reflect on their pedagogical practices in light of this concept. Thus, awareness of the IC concept was promoted in a processual manner throughout the meetings of the Weaving Cognitive Learning Networks Group of the Federal University of Ceará (G-TERCOA/CNPq/UFC). Furthermore, regarding the objectives, this is an exploratory research study, with the purpose of providing more information on the subject, fostering greater familiarity with the problem, and explicitly stating or constructing hypotheses (Prodanov & Freitas, 2013). Furthermore, this research employs a qualitative approach, as the natural environment serves as the primary source of data collection, and the researcher plays a key role (Prodanov & Freitas, 2013). The research environment took place at the meetings of G-TERCOA/CNPq/UFC, with the teachers being members of this research group.

The research procedures were based on a bibliographic analysis of IC practices. According to Severino (2013), bibliographic research is based on data or theoretical categories that have already been explored and recorded by other researchers. To discuss IC with the participating teachers, we sent a questionnaire composed of open-ended questions via Google Forms as a data-collection method. Among the respondents were teachers of pedagogy, mathematics, and other areas. In this research, we selected the teachers responsible for teaching mathematics in the early years. The questions were structured to encourage critical reflection among the teachers participating in the G-TERCOA/CNPq/UFC group, stimulating conceptual understanding, self-reflection, anssd analysis of teaching practice. The instrument facilitated the identification of evidence of changes in pedagogical posture and an understanding of the formative role of IC in the context of the study group.

The proposed questionnaire was available for 10 days for volunteers in this research to access via a link to the electronic form in an instant messaging application. With this, we collected responses from 35 respondents, including 11 mathematics teachers and 24 teachers of other subjects. Of the 11 teachers who teach mathematics, respondents to the questionnaire in this research, only one did not authorize the use of the responses for academic purposes,

leaving 30 responses, that is, 10 in each question. The teachers, subjects of the research, will be referred to as T1 (teacher 1), T2, T3 ... T10. The questionnaire data were analyzed using the Fedathi Sequence as a Data Analysis Methodology (SFMAD), comprising four sub-phases (Meneses et al., 2024). These are described in Table 1 below.

Table 1 Description of the SF sub-phases as a data analysis methodology

Subphases of SFMAD	Description of the sub-phases of SFMAD	Description of the research based on SFMAD
Curation	Initial stage of data collection and presentation for the study	Data collection in the study group using the questionnaire
Minutia	Selection of data produced in the study that meet the objectives of the study	Reflection on the data collected through the questionnaire
Presentation	Description of the data produced in the study, organized into categories of analysis	Presentation/organization/description of the three categories of analysis derived from the questionnaire
Interpretation	Interpretation and analysis of the study results based on the theoretical framework, aiming to address the research objective	The data were analyzed and interpreted based on the participants' responses and the theoretical framework

Source: Adapted from Scipiao (2024)

We inform you that a Free and Informed Consent Form (TCLE) has been prepared and made available on the initial page of the form, where each participant can choose whether to participate in the research before proceeding.

RESULTS AND DISCUSSION

The continuing education of mathematics teachers faces the challenge of balancing more conservative with more innovative methods. In this context, Creative Insubordination emerges as a concept that questions practices lacking theoretical and methodological foundations and that fail to consider others' well-being. However, there is still difficulty in fostering teacher autonomy, capable of training educators to develop pedagogical practices that engage with the contemporary demands of mathematics education to promote meaningful and contextualized learning. To this end, a questionnaire was developed and sent to the members of G-TERCOA/CNPq/UFC, with the following questions, as shown in Table 2.

Table 2 Questionnaire Questions

No.	Questions
1	What does it mean to be a Creative Insubordinate? Please provide examples. Do you consider yourself a Creative Insubordinate teacher?
2	What is the responsibility of a Creative Insubordinate teacher in mathematics teaching?
3	What is the role of Creative Insubordination in the professional development of early-years mathematics teachers?

Source: Authors' elaboration (2025)

Analyzing the research data, we selected those directly related to the following object of study: the influence of Creative Insubordination on changes in the pedagogical posture of

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mathematics teachers in the early years of elementary school in the context of continuing education.

Based on the responses, we organized the categories that will be presented, analyzed, and interpreted in this section. The following are the three categories, related from the questionnaire questions, namely: the implications of becoming aware of the concept of Creative Insubordination; the creative insubordinate teacher in mathematics teaching; the training of teachers who teach mathematics in the early years.

The Implications of Raising Awareness on the Concept of Creative Insubordination

The analysis of this category shows that the teachers participating in the G-TERCOA/CNPq/UFC demonstrate awareness of the meaning of IC in the context of teaching practice. This understanding is reinforced by the fact that the topic is constantly discussed during the study group meetings. According to Andrade and Santos (2025), the group's readings serve as a foundation for discussions and reflections during meetings regarding teacher practices and behavior change.

This perception is aligned with the answers obtained in the first question of the questionnaire, which addresses the definition of the concept, exemplified by participant T2 (questionnaire, 2025), who stated:

> *"It is about moving away from traditional teaching patterns to address more effective student learning, making the environment more welcoming, practical, critical, and safe for both learning and making mistakes. For example, for students who do not yet know the four basic operations, it is necessary to recover this knowledge, which goes beyond the skills and competencies that students are expected to develop at this stage. However, the teacher must creatively retrieve students' prior knowledge through games and applications, so that learning is consolidated in a safe space and, consequently, students can develop the skills necessary for that specific lesson" (T2, questionnaire, 2025).*

According to Lopes and D'Ambrosio (2015), Creative Insubordination (CI) is a critical and responsible attitude that aims to transform conventional pedagogical practices to develop skills such as critical thinking and autonomous problem-solving. This concept is corroborated by the analyzed data, which reveal a broader understanding among teachers regarding the role of CI as a strategy to overcome imposed and decontextualized practices.

To be a Creative Insubordinate teacher, it is often necessary to make the curriculum more flexible through innovative, collaborative actions that go beyond the content presented in the textbook (Scipião, 2024). As highlighted by T1 (questionnaire, 2025), CI involves "the use of means and strategies not foreseen in the school curriculum to promote learning in the classroom, such as evaluating students without relying exclusively on written tests". Furthermore, T3, T7, and T8 (questionnaire, 2025) agree that IC is related to innovation, collaboration, and creativity, stating that: "It is about being creative and innovative, using alternative methodologies such as project-based learning, games, hands-on experiences; more creative assessments; pair or group work; and self-assessment" (T3, questionnaire, 2025). "Being a Creative Insubordinate teacher means creating innovative and responsible strategies that challenge general guidelines for the benefit of the participants in the process, aiming to achieve collectively defined objectives" (T7, questionnaire, 2025).

T8 (questionnaire, 2025) also emphasizes that IC should be reflected in pedagogical actions that involve students' creativity and reflection, expressing that IC refers to the development of "[...] actions with students that stimulate their creativity and reflection on the topics studied".

T6 (questionnaire, 2025) highlights that, by adopting pedagogical practices that respond to the real needs of students, the teacher exercises autonomy by reinterpreting guiding documents in a contextualized way. In doing so, the teacher breaks with the unilateral logic of school results, which is often driven by management focused exclusively on quantitative performance.

> *"The recognition of needs in teaching and learning emerges from the reality of the classroom and is not defined in the guiding documents of pedagogical action. This requires the teacher to make decisions about adopting practices that promote student learning according to the skills and competencies outlined in the BNCC (National Common Core Curriculum) and the descriptors of large-scale assessments, without necessarily adhering to bureaucratic and technocratic standards. Such standards often reinforce the mechanical memorization of content, frequently imposed by the school environment in line with the interests of school management, which tends to focus unilaterally on results, without a multidisciplinary perspective on learning processes" (T6, questionnaire, 2025).*

Thus, Collaborative Learning manifests itself when the teacher opts for innovative, collaborative methodologies, valuing the learning process rather than the final result (Mantoan & Lanuti, 2022) and promoting a multidisciplinary, integrative perspective on student development. For example, T5 (questionnaire, 2025) suggests "allowing students to make choices, discuss their ideas with colleagues and present them to the group without fear of making mistakes".

To broaden the discussion on assessments, it is important to highlight external assessments, notably the Permanent System for the Evaluation of Basic Education in the State of Ceará (SPAECE), which measures student performance, particularly in Portuguese and Mathematics. When conducting these assessments, teachers may feel pressured by student performance, leading to pedagogical practices focused solely on achieving results (Andrade, 2021). T6 (questionnaire, 2025) expresses opposition to this approach, stating the following:

> *"When required to teach students for SPAECE performance, I must turn this moment into an opportunity for them to understand the descriptors in their daily lives and help them recognize that performing well on this assessment is the outcome of a process of dedication in knowledge construction, which will lead each student toward their social emancipation, since mastering Mathematics goes far beyond the school environment"(T6, questionnaire, 2025).*

This teacher's statement reveals a reflective, critical stance towards mathematics teaching, guided by the logic of performance in large-scale assessments such as SPAECE. This perspective aligns with the principles of CI, as it challenges the traditional conception of teaching that focuses solely on achieving high standardized-test scores.

In agreement with T6, T7 (questionnaire, 2025) also expresses concern regarding external assessments, suggesting "making the teaching-learning process enjoyable through the use of active methodologies, since, in many cases, the guidance is limited to solving exercises as the only method to prepare students for external assessments."

Active methodologies are also presented by P10 (2025) when stating that "in education, for example, in a school with a rigid curriculum, the IC teacher will use active

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methodologies in their practice." For Giffoni et al. (2025), active methodologies, when used in conjunction with Digital Technologies, can contribute to educator training by moving beyond traditional conceptions and adopting innovative pedagogical strategies in the teaching of Mathematics.

The responses from T4 and T5 (questionnaire, 2025) reveal significant convergence in understanding the concept of IC, emphasizing two central aspects: pedagogical autonomy and breaking with rigid practices. T4 (questionnaire, 2025) highlights the need to act autonomously, breaking with traditional practices and creating spaces for pedagogical experimentation, stating: "It's about thinking outside the box," suggesting a critical movement that values the ability to propose open and constructive activities.

The responses from T4 and T5 (questionnaire, 2025) also highlight the need to break with rigid and deterministic rules that often limit the creative potential of teaching. For T4 (questionnaire, 2025), this break is associated with "proposing activities that deconstruct traditional practices," while T5 (questionnaire, 2025) reinforces the idea of "overcoming problematic situations with solutions that do not follow conventional paths."

Regarding identification with IC, eight mathematics teachers reported considering themselves Creative Insubordinates, one stated that they identify with this stance only in certain situations, and another responded that they do not identify with this concept.

The fact that most teachers identify as Creative Insubordinates indicates a positive outcome for the adoption of innovative, collaborative, and critical pedagogical practices in mathematics teaching. This suggests that these teachers value pedagogical autonomy, develop reflective practices, and recognize the fundamental role of creativity in teaching and learning processes.

T2 (questionnaire, 2025), who answered "sometimes" may feel insecure, divided by imposed guidelines, or may not yet fully recognize the importance of this concept in their practice. T9 (questionnaire, 2025), who does not consider themselves a Creative Insubordinate, may be more conservative or have difficulty breaking with traditional pedagogical practices. Furthermore, T6 (questionnaire, 2025) states that "the recognition of needs in the teaching-learning process emerges from the reality of the classroom and is not defined in the guiding documents of pedagogical practice [...]" as is the case with the National Common Curricular Base (BNCC) (Brazil, 2017).

The curriculum needs to be flexible and aligned with the realities of the students, granting autonomy to teachers so that their creativity is not limited by a rigid and static curriculum, incapable of meeting individual demands or addressing their challenges (Santos & Matos, 2017). The authors agree with T1 (questionnaire, 2025), which states that "IC consists of using means and strategies not foreseen in the curriculum to foster learning in the classroom".

T7 and T8 (questionnaire, 2025) agree with T3 that CI is related to innovation, collaboration, and creativity, as stated:

> *"It is about being creative and innovative, using alternative methodologies such as project-based learning, games, hands-on experiences; more creative assessments, peer or group work, and self-assessment" (T3, questionnaire, 2025).*
>
> *"Being a creative insubordinate is about creating innovative and responsible possibilities that oppose general guidelines in favor of the individuals involved in the process" (T7, questionnaire, 2025)*

considering that each individual has their own specificities.

According to Sousa Neta (2024), the fact that each student is unique does not imply that the teacher should create a completely individualized plan for each one, but rather that they should take into account their specificities, being creatively insubordinate when proposing diverse methodologies that meet the needs and potentialities present in the classroom.

For innovation to occur, the teacher must change their posture in order to improve pedagogical practices, select high-quality methodologies, and develop new forms of assessment, using the curriculum as a reference document (Santos & Matos, 2017; Santos, 2022). Furthermore, the change in the teacher's posture favors creative forms of insubordination, enabling greater interaction and motivation when dealing with challenging situations and using other methodologies (Sousa Neta et al., 2025).

In this sense, improving these practices ranges from action planning to evaluations, whether internal or external. Andrade (2021) conducts a study that discusses the implications of the evaluation carried out by SPAECE and its relationship with the school curriculum in the teaching-learning process of mathematics.

D'Ambrosio and Lopes (2015) state that teachers who demonstrate IC question rigid postures, standardized assessments, or quantitative measures of learning, which aligns with T6's reflection (questionnaire, 2025) on the use of the SPAECE performance moment to understand the descriptors in their daily lives and make them recognize that good performance in this assessment is the end result of a process of dedication to the construction of knowledge.

The implications of awareness about IC are transformative for the school context, as they constitute a conscious movement towards new practices, such as innovative and collaborative ones, strengthening emancipation from the rigidity of the school system. The following section discusses the actions of a Creative Insubordinate teacher in favor of their students.

T9 (questionnaire, 2025) offers a differentiated perspective on IC, focusing on the appreciation of intellectual diversity and the construction of a collaborative teaching-learning process. This view expands the concept by linking pedagogical creativity not only to the breaking of rigid practices, but also to an empathetic approach, emphasizing respect for the teaching-learning process.

The Creative Insubordinate Teacher in Mathematics Education

The teachers' responses can be grouped into four aspects: active and dynamic methodologies, critical and autonomous teacher training, connection with reality, and intentional planning. With regard to the aspect of active and dynamic methodologies, T1, T3, and T4 (questionnaire, 2025) highlight the use of strategies, technologies, and creative and interactive practices that make classes dynamic and meaningful. For Scipião et al (2022), it is necessary to have methodologies that include the student in the teaching-learning process,

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making him/her an autonomous, active, and reflective subject. Thus, according to T3's statement, (questionnaire, 2025), "the teacher should seek different methods and/or more dynamic strategies for teaching, such as technologies, practical projects or interactive approaches." Agreeing with T3, T1 (questionnaire, 2025) emphasizes the importance of offering diverse and meaningful strategies, and T4 (questionnaire, 2025) highlights the importance of pointing out paths while working creatively, following the same line of reasoning.

Regarding critical thinking and autonomy, T2 and T3 (questionnaire, 2025) emphasize the development of students' critical and creative thinking skills, promoting autonomy and interest in mathematics. The teacher should "seek to make learning more dynamic, encourage critical thinking, and contextualize mathematical concepts to the realities of the students" (T2, questionnaire, 2025). T7 (questionnaire, 2025) also mentions the teacher's role in civic education, empowering students as agents in the teaching-learning process.

T1, T3, and T4 (questionnaire,2025) highlight the use of creative, interactive strategies, technologies, and practices that make lessons dynamic and meaningful. “The teacher must seek different methods and/or more dynamic strategies for teaching, such as technologies, practical projects, or interactive approaches” (T3, questionnaire, 2025). In agreement with T3, T1 (questionnaire,2025) emphasizes the importance of “offering different and meaningful strategies,” and T4 (questionnaire,2025) highlights “pointing out paths while working creatively,” following the same line of thought.

Regarding critical thinking and autonomy, T2 and T3 (questionnaire, 2025) emphasize developing students’ critical and creative thinking skills and promoting autonomy and interest in mathematics. The teacher should “seek to make learning more dynamic, encourage critical thinking, and contextualize mathematical concepts to students’ realities” (T2, questionnaire, 2025). T7 (questionnaire, 2025) also mentions the teacher’s role in civic education, empowering students as agents of the teaching-learning process.

Concerning the relevance of content to reality, T2 and T6 (questionnaire,2025) stress the importance of contextualizing mathematics with students’ realities and everyday cultures. T9 (questionnaire, 2025) further highlights the need to “start from students’ prior knowledge,” valuing their previous experiences.

The accounts reveal a pursuit of solutions that address students’ real needs, through the use of active methodologies, the valorization of practical activities, and the break from a decontextualized mathematics marked by a less meaningful approach. Sousa Neta (2024) states that “focusing on learners’ needs is very important for overcoming this conservatism, in order to propose bold and creative situations.” D’Ambrosio & Lopes (2015) and Santos & Lopes (2019) affirm that, to meet learners’ needs while prioritizing their learning, it is necessary to break with institutional bureaucracies.

In addition to T9 (questionnaire,2025), others such as T1, T3, and T4 (questionnaire,2025) address this same theme regarding the change in pedagogical practices, as can be observed: “The teacher should seek different and/or more dynamic strategies for teaching, such as technologies, practical projects, or interactive approaches” (T3, questionnaire, 2025). T6 (questionnaire, 2025) highlights the importance of adopting pedagogical practices that dialogue with the real needs of students (Mantoan & Lanuti, 2022).

To this end, Scipião (2024) states that teachers must reflect on their practice to enable the possibility of change.

It is worth noting that T9 (questionnaire, 2025) reinforces this idea, aiming to explore diversified pathways to improve learning, that is, promoting differentiated practices in their classes. Scipião (2024) emphasizes the need to reflect on which methodology to use and how to apply it in pedagogical practice. Scipião et al. (2023) stress the importance of creating diverse strategies to meet different learning styles.

T1 (questionnaire, 2025) also highlights the importance of "offering different and meaningful strategies," as Scipião (2024) points out the need for both teacher and student to work collaboratively to produce new knowledge. T4 emphasizes the importance of "pointing the way, working creatively."

In this sense, when the teacher recognizes and values each student's uniqueness, treating them as an individual and encouraging them to follow their own learning paths, they promote CI actions. Such attitudes reveal a constant pursuit of knowledge, in line with D'Ambrosio & Lopes (2015).

T8 (questionnaire,2025) also stresses that CI actions should translate into pedagogical practices that foster students' creativity and reflection, expressing that CI refers to the development of "[...] actions with students that mobilize their creativity and reflection on the topics studied." This creativity is emphasized by Santos (2017), who argues that the curriculum cannot be rigid but must be dynamic and contextualized to enable the teacher's autonomy, so as not to restrict the student's creativity.

Based on this, teachers note that being a CI teacher entails developing pedagogical practices aligned with students' socio-cultural realities. This involves breaking away from rigid curricula and bureaucratic structures that hinder meaningful access to mathematical knowledge. This stance is consistent with D'Ambrosio & Lopes (2015), who advocate for the centrality of students' prior knowledge and context as fundamental elements for emancipatory teaching. Santos (2017) argues that surveying prior knowledge helps balance the student's existing knowledge with the content taught by the teacher.

For emancipatory teaching, the teacher must plan activities in an increasingly intentional, innovative, and contextualized manner, as expressed by T5 (questionnaire,2025), who emphasizes the need for intentional planning, asserting that the CI teacher should "plan their lessons intentionally, being clear about the objectives they aim to achieve, bringing games into the classroom, problematizing situations, giving voice and space to their students, recording and documenting to ensure the learning of all, and respecting each one's pace" (T5, questionnaire, 2025).

This perspective aligns with the BNCC (Brazil, 2017), which states that lesson planning should be aligned with the general and specific competencies of each area, considering students' particularities and promoting learning (Brazil, 2017). To achieve such alignment, T2's statement indicates the need to rethink traditional methods, encouraging more creative and critical practices, and helping teachers foster student engagement to improve the teaching-learning process.

When the teacher adopts a creative insubordinate stance in favor of student learning, they break away from rigid models and propose innovative-collaborative practices. This idea

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is exemplified by T10 (questionnaire, 2025), who explains that "in education, for instance, in a school with a rigid curriculum, the CI teacher will use active methodologies in their practice." Based on this, Santos (2017) states that a frozen and rigid curriculum does not meet students' needs nor solve their problems.

T3, T7, and T8 (questionnaire, 2025) further add that adopting this stance also requires creativity and innovation through active teaching methodologies, such as project-based learning, games, practical experiences, more creative assessments, peer or group work, and self-assessment. Active methodologies are pathways for advancing knowledge through new practices, as stated by Moran (2015).

Thus, participants' statements reinforce the idea that CI, in the context of teaching practice, is directly linked to autonomy, sensitivity to students' uniqueness, and the adoption of innovative, collaborative pedagogical strategies. According to Scipião (2024), this adoption requires the development of differentiated practices that promote both teacher and student engagement and protagonism in joint work.

Teachers who identify with this stance break with more rigid models and begin to build more meaningful and emancipatory teaching-learning processes. By valuing students' socio-cultural context and using active methodologies, these educators expand the possibilities for the construction of mathematical knowledge in a critical and collaborative way, contributing to a fairer education.

T5 (questionnaire, 2025) emphasizes the need for intentional planning, stating that the CI teacher should "plan lessons intentionally, with well-defined objectives, incorporating games into the school environment, promoting problematization of situations, ensuring space for active student participation, and recording and documenting the process to support learning for all".

Creative Insubordination in the Professional Development of Teachers Who Teach Mathematics

The idea of Creative Insubordination in the professional development of teachers of mathematics is understood in different ways but converges on key points: reflecting on conservative teaching practices, fostering critical-reflective formation, promoting inclusion, and supporting teacher autonomy.

To reflect on conservative teaching, teachers' practices must be transformed. According to T1 (questionnaire,2025), it can "generate new educational practices," while T5 emphasizes that Creative Insubordination has the role of:

> *"...help create new practices in Mathematics Education that engage students in reflection and inquiry. Analyze these practices and evaluate whether we are merely responding positively to public and institutional policies, without realizing that, collaboratively, we can go beyond this belief in a formation that prioritizes mastery of mathematical content instead of fostering a holistic education. This approach allows for the development of teacher identity based on ethical and supportive principles" (T5, questionnaire, 2025).*

Supporting the idea presented above, T9 (questionnaire, 2025) emphasizes the importance of exploring diverse pathways for learning and breaking away from non-innovative methodologies.

Regarding the development of a critical and reflective formation, T2 and T3 (questionnaire,2025) emphasize the need to rethink the methods used, ensuring that Creative Insubordination "plays the role of rethinking methods, encouraging more creative and critical practices, helping teachers promote student engagement and critical thinking" (T2, questionnaire, 2025). In alignment, T3 (questionnaire,2025) states that "breaking teaching patterns contributes to critical thinking, the use of multidisciplinary approaches, and the appreciation of students' diverse cultures."

Another point concerns inclusion, as T3 (questionnaire,2025) highlights the importance of valuing different cultures, being inclusive, and eliminating the fear of mathematics. To this end, T7 emphasizes the integration of content with students' realities, noting that CI contributes to "designing lessons that link content with the reality of their class" (T7, questionnaire, 2025).

Complementing this perspective, T6 (questionnaire, 2025) proposes mathematics teaching that goes beyond mechanization, suggesting "contextualized and reflective mathematical literacy" (T6, 2025).

The accounts reveal that Creative Insubordination (CI) directly contributes to the development of more critical and autonomous teachers. Moreover, teachers who adopt a creative stance promote more participatory learning environments, in which mathematical knowledge is constructed in a contextualized, problem-posing, and collaborative manner. This points to a conception of teaching that moves away from the traditional model focused exclusively on content delivery and preparation for external assessments.

This perspective is reinforced when the mathematics teacher recognizes and values each student, as exemplified by T5 (questionnaire,2025), who states the importance of respecting each learner's pace. In this regard, T3 (questionnaire, 2025) emphasizes that such action enables appreciation and reduces the fear of mathematics.

According to the Parâmetros Curriculares Nacionais (PCN) (Brazil, 1998), the role of the mathematics teacher is to act as a mediator between mathematical knowledge and the learner and to organize activities that foster learning. In reference to the Base Nacional Comum Curricular (BNCC) (Brazil, 2017), pedagogical actions in the early years of Elementary Education should be planned so that students are encouraged to create and recreate mathematical models that promote problem-solving through autonomy and freedom to reflect and organize different solution strategies, thereby fostering the development of mathematical reasoning.

Aligned with this conception, T2 and T3 (questionnaire, 2025) share the view that it is necessary to rethink traditional methods to facilitate mathematics learning, ensuring the development of reasoning and affirming that CI "plays the role of rethinking traditional methods, encouraging more creative and critical practices, helping teachers to promote student engagement and critical thinking." According to Scipião (2024), this change in teaching stance may occur both during the teacher's classroom actions and in formative moments that allow reflection on their own practice.

We can see that the statements reinforce the idea that continuing professional development of teachers who teach mathematics, from the perspective of CI, is linked to pedagogical practices that challenge fully traditional models that fail to bring mathematics

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closer to students' daily lives. As emphasized by D'Ambrosio & Lopes (2015), mathematics learning should be understood as a critical and reflective process, capable of contributing to the learner's autonomy.

Reflections on praxis encompass, on one hand, the pursuit of autonomy manifested through acts of CI related to the curriculum, and, on the other hand, the practices of oppressors, characterized by anti-dialogical actions that stifle CI, silencing both teachers and school leaders (Santos & Matos, 2017).

CI also plays a relevant role in teacher education regarding inclusive practices. T3 (questionnaire,2025) stresses the importance of valuing different cultures, being inclusive, and eliminating the fear of mathematics, with the need to link content to students' realities. T7 (questionnaire, 2025) adds that the practice of CI requires an awareness of the educator's reality, as well as courage and boldness to transform school spaces into environments connected to students' life contexts (D'Ambrosio & Lopes, 2015).

Thus, we can infer that teachers who engage in creative insubordinate practices provide their students with opportunities to develop problem-solving skills in a practical, contextualized, and meaningful way, breaking with the logic of mathematics teaching focused exclusively on external assessments. This is explained by Santos (2021), who states that it is difficult to imagine educational processes that do not lead to forms of judgment, which demands that such processes be conducted with responsibility, criticality, and sensitivity beyond numerical results.

Although there is recognition of the need to subvert established orders, the data also point to challenges faced by teachers, such as institutional resistance to maintaining order through pressure for standardized results. Therefore, creative insubordination requires courage and boldness to challenge normativity, demanding that teachers be aware of and able to justify their pedagogical practices as innovative and collaborative.

T4 and T8 (questionnaire,2025) agree that CI promotes teacher autonomy, with T4 stating that responsible subversion "contributes to teacher Autonomy, Creativity, and Collaborative Work" (T4, questionnaire, 2025). T8 (questionnaire, 2025) focuses on reflective formation and critical thinking about teaching practice, affirming that CI helps "train teachers to think and reflect on their teaching practice."

According to D'Ambrosio & Lopes (2015), the responsible subversive teacher is one who, when faced with situations for which they do not have ready answers, is challenged to act in a reflective manner.

CONCLUSION

This study addresses the continuing education of mathematics teachers within the study group, highlighting the challenges they face amid both more rigid and more innovative-collaborative pedagogical practices. The research emphasizes the need to break with conservative approaches that still predominate in both classroom practice and teacher training, considering contemporary sociocultural complexities. The objective is to analyze the influence of Creative Insubordination (CI) on changing the attitudes of mathematics teachers in the early years of schooling and on the formation of their students. A central concept discussed is CI, which proposes a critical and reflective pedagogical stance that fosters

innovative, collaborative practices aimed at breaking with more rigid paradigms. CI does not imply irresponsible rupture, but rather conscious and ethical engagement in favor of improving the teaching-learning process. The results, collected through questionnaires answered by teachers from the G-TERCOA group, indicate that most educators understand CI as a practice that values creativity, autonomy, and the contextualization of mathematics teaching. Teachers highlight that being a CI educator involves using active methodologies, encouraging critical thinking, and promoting teaching that dialogues with students' realities, breaking with conventional practices that prioritize memorization and content reproduction. In the context of external assessments, such as SPAECE, teachers also reflected on the challenges of reconciling meaningful teaching with the quantitative demands of such evaluations. CI emerges as a strategy for using assessment moments to develop skills that go beyond rigid practices, fostering mathematical understanding in everyday life. In this sense, CI proved to be a relevant concept in continuing teacher education by enabling pedagogical practices that value collaboration, inclusion, and both teacher and student autonomy. The research revealed that teachers who adopt CI tend to plan their lessons intentionally, valuing practical, reflective, and contextualized activities that consider students' prior knowledge.

However, the study also indicates significant challenges, including institutional resistance to change and pressure to achieve standardized results. Adopting CI requires courage and boldness to question hegemonic practices, promoting a reflective stance that places students' well-being at the center. Regarding future research, there is potential to analyze how the initial training of mathematics teachers can more systematically incorporate the principles of CI, contributing to the development of critical, creative, and innovative-collaborative pedagogical stances. Thus, this study is part of a broader movement of reflection and change in teaching practice, proposing an approach that breaks with mere reproduction and aligns with an education committed to integral formation.

We conclude that continuing education needs to invest in critical reflection and the autonomy of teachers so that they can implement pedagogical practices aligned with contemporary demands. In this way, continuing education is configured not only as an innovative-collaborative pedagogical strategy, but also as an ethical and political stance that seeks to promote emancipatory teaching and strengthen the critical role of teachers.

REFERENCES

Andrade, W. M. (2021). *The Permanent System for the Evaluation of Basic Education of Ceará (SPAECE) and the school curriculum: Implications for the 9th grade of elementary school* (Doctoral dissertation). Federal University of Ceará, Fortaleza, Brazil.

Andrade, W. M., & Santos, M. J. C. dos. (2025). Grupo de Estudos e Pesquisas Tecendo Redes Cognitivas de Aprendizagem (G-TERCOA/CNPq/ UFC): uma década de pesquisas. *Revista Ibero-Americana De Estudos Em Educação*, 20(00), e19679. Recuperado de https://periodicos.fclar.unesp.br/iberoamericana/article/view/19679

Bezerra, A. M. A. (2023). *Weaving cognitive networks between the mathematical education of the pedagogue and algebraic thinking: Reflections from focus groups* (Doctoral dissertation). Graduate Program in Brazilian Education, School of Education, Federal University of Ceará, Fortaleza, Brazil.

 ISSN 3110-1895

Brazil. (1988). *Constitution of the Federative Republic of Brazil of 1988*. Presidency of the Republic. http://www.planalto.gov.br/ccivil_03/constituicao/constituicao.htm

Brazil. Ministry of Education. (2017). *National Common Curricular Base: Basic education*. http://basenacionalcomum.mec.gov.br

D'Ambrosio, B. S., & Lopes, C. E. (2015). Creative insubordination: An invitation to reinvent the mathematics educator. *Bolema*, *29*(51), 1-17. https://doi.org/10.1590/1980-4415v29n51a01

Freire, P. (1987). *Pedagogy of the oppressed*. Paz e Terra.

Giffoni, E. de F., Côrtes, M. A., Morano, D. A. C. M. S., & Cerqueira, G. S. (2025). O papel da sequência Fedathi, das metodologias ativas e das tecnologias digitais no ensino de matemática. *Góndola, Enseñanza y Aprendizaje de las Ciencias, 20*(3). https://doi.org/10.14483/23464712.21743

Lopes, C. E., & D'Ambrosio, B. S. (2015). Creative insubordination of mathematics educators evidenced in their narratives. In *Proceedings of the 14th Inter-American Conference on Mathematics Education* (pp. 1-12). CIAEM-IACME. https://xiv.ciaem-redumate.org/index.php/xiv_ciaem/xiv_ciaem/paper/viewFile/391/189

Mantoan, M. T. E., & Lanuti, J. E. D. O. E. (2022). *A escola que queremos para todos*. Editora CRV.

Meneses, E. N. de, Azevedo, I. F. de, Marques, K. C. V. de C., Scipião, L. R. de N. P., Santos, C. A. dos, & Santos, Ms. J. C. dos. (2024). The Fedathi sequence as a data analysis methodology. *Caderno Pedagógico*, *21*(9), e7994. https://doi.org/10.54033/cadpedv21n9-195

Moran, J. M. (2015). Changing education with active methodologies. In *Media convergences, education, and citizenship: Youth approaches* (Contemporary Media Collection). http://www2.eca.usp.br/moran/wp-content/uploads/2013/12/mudando_moran.pdf

Prata, G. C. F. B. (2023). *Mathematics teacher education: Awareness as an intersection between Mathematical Literacy, the Fedathi Sequence, and the Theory of Objectification* (Doctoral dissertation). Graduate Program in Brazilian Education, School of Education, Federal University of Ceará, Fortaleza, Brazil.

Prodanov, C. C., & Freitas, E. C. de. (2013). *Scientific work methodology: Research methods and techniques* (2nd ed.). Feevale.

Santos, M. J. C. dos. (2017). Curriculum, teacher education, and public policies. In *Book of abstracts - VIII CIBEM* (Vol. 1, p. 32). Spanish Federation of Societies of Mathematics Teachers.

Santos, M. J. C. dos. (2021). Mathematics in the early years of elementary school: Curriculum and assessment. *Revista Cocar*, *15*(33). https://periodicos.uepa.br/index.php/cocar/article/view/4446

Santos, M. J. C. dos. (2022). *Mathematics teaching: Theoretical discussions and successful formative experiences for elementary school teachers*. CRV.

Santos, M. J. C., & Matos, F. C. C. (2017). Creative insubordination in the continuing education of pedagogues for teaching mathematics: Do the subalterns speak? *Revista de Ensino de Ciências e Matemática*, *8*(4), 11-30. https://doi.org/10.26843/rencima.v8i4.1491

Santos, P. C., & Lopes, C. E. (2019). Acts of creative insubordination revealed in the autobiographical narrative of a mathematics teacher. *Revista Internacional de Pesquisa em Educação Matemática*, *9*(3), 97-113. https://doi.org/10.37001/ripem.v9i3.2225

Scipião, L. R. N. P. (2024). *Pedagogical innovation: A link between the Fedathi sequence, the theory of objectification, and creative insubordination for changing teaching practice* (Doctoral dissertation). Graduate Program in Teaching of the Northeast Education Network, Science Center, Federal University of Ceará, Fortaleza, Brazil.

Scipião, L. R. de N. P., Sousa Neta, F. de S. N., Damasceno Júnior, J. A., Menezes, D. B., & Santos, M. J. C. dos. (2023). Learning styles in teacher continuing education: Reflections on the extension course. *Revista Thema*, *22*(2), 342-357. https://doi.org/10.15536/thema.V22.2023.342-357.3224

Scipião, L. R. de N. P., Carvalho, E. de F. G. de, Muniz, Q. H. M. A., Santos, M. J. C. dos, & Menezes, D. B. (2022). Flipped classroom: A strategy for implementing active methodologies in times of the Covid-19 pandemic. Research, Society and Development, 11(4), e35311427426. https://doi.org/10.33448/rsd-v11i4.27426

Severino, A. J. (2013). *Scientific work methodology* [e-book]. Cortez.

Sousa Neta, F. de. (2024). *Creative insubordination and universal pedagogical design: Reflections on the teaching practices of mathematics teachers in the early years* (Master's thesis). Federal University of Ceará, Fortaleza, Brazil.

Sousa Neta, F. de, Scipião, L. R. de N. P., & Santos, M. J. C. dos. (2025). The Fedathi Sequence Methodology in creative insubordinate pedagogical practices in mathematics teaching: A systematic literature review. *Revista Baiana de Educação Matemática*, *6*(1), e202516. https://doi.org/10.47207/rbem.v6i1.23762

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