TEACHERS' FORMATION AND PUBLIC POLICY

Thematic research in the remote context: challenges and possibilities on countryside education undergraduate courses

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ABSTRACT. Research on Scientific Education in Latin America, especially in Brazil, has discussed the contextualization of Paulo Freire's political-pedagogical assumptions for school education. In these studies, the process of obtaining Generating Themes has been a possibility for the realization of a transforming praxis, but with the pandemic it has faced theoretical-methodological obstacles. We investigated the understanding of supervisors working in the Institutional Program of Initiation to Teaching Scholarship (PIBID), in Countryside Education Undergraduate courses of the Federal University of Recôncavo da Bahia, who participated in a remote training process of teachers, based on Generating Themes. Interviews were conducted with supervisors who were recorded in audio and analyzed via Discursive Textual Analysis, through the categories: Theoretical-methodological and technological aspects for a remote ethical-critical training; Knowing the local reality through the eyes of the other and transforming it together, even though they are distant. Among the results, it is noteworthy that educators, on the one hand, reported that the difficulties of a remote transformative praxis are related to the lack of adequate structure and resources for remote teaching and, on the other hand, the digital platforms made dialogicity and problematization between subjects from different locations possible, constituting as tools allied to remote work with Generating Themes.

Keywords: Paulo Freire; rural education; generating theme; remote teaching; science education.

A Investigação Temática no contexto remoto: desafios e possibilidades na Licenciatura em Educação do Campo

RESUMO. Pesquisas sobre Educação em Ciências na América Latina, em especial no Brasil, têm discutido a contextualização de pressupostos político-pedagógicos de Paulo Freire para a educação escolar. Nesses estudos, o processo de obtenção de Temas Geradores tem sido uma possibilidade para a realização de uma práxis transformadora, mas que, com a pandemia, se deparou com alguns obstáculos teórico-metodológicos. Portanto, objetiva-se investigar a compreensão de supervisores que atuam no Programa de Iniciação à Docência, no curso de Licenciatura em Educação do Campo, da Universidade Federal do Recôncavo da Bahia, que participaram de um processo formativo remoto, para professores, pautado em Temas Geradores. Para isso foram realizadas entrevistas com os supervisores, que foram gravadas em áudio, transcritas e analisadas via Análise Textual Discursiva, em que emergiram as categorias: Aspectos teórico-metodológicos e tecnológicos para uma formação ético-crítica remota; conhecer a realidade local pelo olhar do outro e transformá-la juntos mesmo distantes. Dentre os resultados, destaca-se que os educadores, por um lado, relataram que as dificuldades de uma práxis transformadora remota estão relacionadas à falta de estrutura e recursos adequados ao ensino remoto e, por outro, as plataformas digitais viabilizaram a dialogicidade e problematização entre sujeitos de diferentes localidades, constituindo-se como ferramentas aliadas ao trabalho remoto com Temas Geradores.

Palavras-chave: Paulo Freire; educação do campo; tema gerador; ensino remoto; educação em ciências.

Investigación temática en el contexto remoto: retos y posibilidades en el Grado en Educación Rural

RESUMEN. La investigación en Educación Científica en América Latina, especialmente en Brasil, discutió la contextualización de las presiones político-pedagógicas de Paulo Freire para la educación escolar. En estos estudios, el proceso de obtención de Temas Generadores ha sido una posibilidad para la realización

de una praxis transformadora, pero con la pandemia se ha enfrentado a obstáculos teórico-metodológicos. Por lo tanto, investigamos la comprensión de los supervisores que laboran en el Programa de Iniciación Docente (PIBID), en el Curso de Pregrado en Educación de Campo de la Universidade Federal do Recôncavo da Bahia, quienes participaron en un proceso de capacitación a distancia para docentes, basado en Generación de Temas. Se realizaron entrevistas con los supervisores, las cuales fueron grabadas en audio, transcritas y analizadas mediante Análisis Textual Discursivo, emergiendo las categorías: Aspectos teórico-metodológicos y tecnológicos para una formación ético-crítica remota; Conocer la realidad local a través de los ojos del otro y transformarla en conjunto, aunque sea distante. Entre los resultados, se destaca que los educadores, por un lado, informaron que las dificultades de una praxis transformadora remota están relacionadas con la falta de estructura y recursos adecuados para la enseñanza a distancia y, por otro lado, las plataformas digitales posibilitaron la dialogicidad y problematización. entre sujetos de distintas localizaciones, constituyendo herramientas aliadas al trabajo remoto con Generación de Temas.

Palabras clave: Paulo Freire; educación rural; generador de temas; enseñanza remota; enseñanza de las ciências.

Introduction[1]

Studies conducted in Latin America have discussed the contextualization of Paulo Freire's political-pedagogical assumptions for Science Education, as exemplified by Defago and Ithuralde (2021), Delizoicov, Delizoicov, and Silva (2020), and Franco-Avellaneda and Corrales-Caro (2021). In Brazil, those emphasizing the process of obtaining Generative Themes stand out, enabling the structuring of Political-Pedagogical Projects (PPP), curriculum organization, and the planning of didactic-pedagogical activities at various levels of education (Centa & Muenchen, 2016; Milli, Almeida & Gehlen, 2018a; Silva, 2004).

One of the contexts in which Freirean assumptions need to be increasingly addressed is in Countryside Education (EdoC) due to the need to consider the historical-cultural aspects that constitute the local reality, both to understand it critically and to transform it collectively (Kato, Sandron, & Hoffmann, 2021). For this purpose, it is essential to include discussions of this nature in Countryside Education degree programs (LEdoC) such as those offered by various educational institutions in Brazil. Regarding the initial training of rural educators, Augusto, Souza, Souza, and Porto (2019) emphasize that internships and training programs in EdoC enable undergraduates to engage in teaching from the outset, the Institutional Teaching Initiation Program (PIBID)[2] being a space for exchange between University and School in which the graduate teaches directly at the school (Jesus, Torres, Oliveira, & Costa, 2021). According to Sousa (2018), the implementation of PIBID in EdoC not only promotes training in Community Times (TC) and University Time (TU)[3], but also contributes to the retention of students in the EdoC course, since otherwise "[...] these individuals lack financial resources to continue their academic studies" (Sousa, 2018, p. 115).

Furthermore, PIBID in LEdoC has significantly contributed to ensuring the retention of students in Higher Education in Brazil (Sousa, 2018; Jesus et al., 2021). However, with the COVID-19 pandemic and the suspension of in-person activities in educational institutions, LEdoC courses and PIBID actions had to seek alternatives for remote actions, such as activities developed based on Paulo Freire's framework. Some studies use the Freirean perspective as a structuring axis in the training of rural teachers (Brick, Pernambuco, Silva, & Delizoicov, 2014; Moreno, 2020; Kato et al., 2021; Paniz, 2017). Moreno (2020), for example, through the development of some stages of Thematic Investigation in a specialization course with graduates from LEdoC, identified the possibility of interdisciplinary work with Natural Sciences teachers through the Freirean perspective. The author indicates the Generative Theme as a way to highlight the relationship between problematization, dialogicity, and contextualization, considering the local rural reality as a fundamental point for the construction of a transformative praxis, as pointed out by Brick et al. (2014).

For Freire (1987, p. 45), problematization and contextualization are carried out through dialogue, which 'is' "[...] an existential requirement [...] it is the meeting in which the reflection and actions of its subjects addressed to the world to be transformed and humanized are united." By considering substantial principles such as dialogue, encounter, solidarity, transformation, and humanization in the new reality imposed by the

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[2] PIBID is a Brazilian teaching initiation program for undergraduate students with some assumptions, such as: teacher training based on everyday school experiences, theoretical, methodological, and practical experiences, providing opportunities for exchanges between school teachers and teachers in initial training (Brito, Massena, & Siqueira, 2016).

[3] There are several TC and TU formats; at TC, there are training periods in the University environments, in a direct relationship with teachers and other students on the course; At TC, students develop actions/exchanges with the community.

COVID-19 pandemic situation, where the only possible contact with the subjects of schools and communities has been carried out remotely. Therefore, the question arises: can the development of Thematic Investigation be feasible in a remote context? How can one understand the other and transform reality without contact with the materiality in which the subjects are inserted?

Guided by these questions, the objective of this study is to investigate the understanding of supervisors who work in the PIBID of LEdoC at the Federal University of Recôncavo da Bahia (UFRB) regarding the implications and contributions of a remote formative process based on Thematic Investigation for obtaining Generative Themes. With this formative proposal, the aim was to provide a space for discussion and implementation of some of Paulo Freire's assumptions as an alternative to a critical-transformative education, considering the challenges imposed by the necessary restrictions due to the pandemic reality.

The challenges of Humanizing Education in times of social isolation

Paulo Freire's humanizing education is essentially based on dialogicity, worldviews, culture circles, investigation, and problematization of the subjects' reality (Freire, 1987). With the pandemic caused by the SARS-CoV-2 virus, studies and practices using the Freirean perspective have encountered numerous challenges, mainly due to social distancing, which in a situation of remote teaching has exacerbated social inequalities (Araújo, Oliveira, Trindade, & Nicolau, 2021; Imberti, Pereira, Paula, Gonçalves, & Coitinho, 2021; Nunes, 2020; Oliveira, Rezende, Ferreira, & Falcão, 2021).

Even with record deaths, the proliferation of SARS-CoV-2 variants, and constant warnings from scientists about the importance of sanitary measures, the market's discourse that 'there is no way to stop' has led Brazil to one of the worst social, economic, and political scenarios in the world (Araújo et al., 2021). The collapse of the public health system, mass layoffs, rising prices of basic food items, scientific denialism, and state negligence have culminated in a worrying process of dehumanization (Ribeiro & Mainieri, 2021). Faced with this situation, initiatives proposing humanization have encountered obstacles related to both the problems of underfunding and scarcity of public resources for education, and the latent social contradictions in the pandemic (Araújo et al., 2021; Imberti et al., 2021; Nunes, 2020; Oliveira et al., 2021).

Nunes (2020) emphasizes that it is precisely when dehumanization manifests that liberating education becomes necessary, as a political act of awareness and transformation of reality. According to Oliveira et al. (2021), the pandemic has also highlighted the indispensability of democratic educational policies so that in times of crisis there is planning and responsibility towards academic demands, which are inseparable from social demands. Even with all the limitations of the educational alternatives currently used, Imberti et al. (2021, p. 562) emphasize that:

> It is possible to think and envision an emancipatory education within the practices (albeit emergency ones) of remote teaching and distance learning (EaD), even with the technological mediation of dialogue being an innate characteristic of this modality. This positioning is justified mainly on two pillars: the historical condition of today's society and Paulo Freire's conception of dialogue.

Given the need to use technology as a means for the development of a dialogical-problematizing education in times of pandemic, it is also necessary to consider the individuals who do not have access to these technologies. Cardoso, Ferreira & Barbosa (2020) point out that in the year 2019, 39% of students in the Brazilian public school system did not have access to computers at home. This indicates that the economically disadvantaged population faces more difficulties in accessing information and communication technologies.

The work with Generative Themes in Freirean Pedagogy

In the Freirean perspective, investigating the local reality is an essential activity for a humanizing educational process, as it is through it that educators can understand the language, thought, culture, values, history, and social dynamics that coexist with the pedagogical dynamics in the school (Delizoicov, 1991; Silva, 2004). The investigation of reality, proposed by Freire (1987), is based on dialogue with the subjects who compose both the local and school community, to provide the externalization of different perceptions about the same reality. It is at this moment of tension between different reports about the locality that limit situations are identified, that is, problematic views due to being fatalistic and/or contradictory about the material and historical conditions in which the subjects themselves are immersed:

Will men be externalizing their worldview, their way of thinking about it, their fatalistic perception of 'limit situations,' their static or dynamic perception of reality? And in this expressed way of thinking the world fatalistically, of thinking it dynamically or statically, in the way they confront the world, their 'generative themes' are involved (Freire, 1987, p. 56, emphasis in the original).

The Generative Themes, as presented by Paulo Freire, encompass the synthesis of problematic situations existing in a certain reality, enabling students to engage in critical reflection and transformative action, as they represent the limit situations of the subjects. The identification of these situations allows for new understandings to be constructed for a new perspective on reality, characterized ethically and critically (Demartini & Silva, 2021).

The process of obtaining the Generative Theme is carried out through Thematic Investigation, proposed by Paulo Freire for the context of Youth and Adult Literacy. In a reinterpretation, it was systematized by Delizoicov (1991) for school education, comprising five stages, namely:

1) Preliminary Survey: study of the reality of the local community;

2) Encoding: analysis and selection of social contradictions experienced by community residents;

3) Decoding: limit situations are legitimized by the community and synthesized into Generative Themes;

4) Thematic Reduction: selection of scientific concepts, content, and actions for understanding the theme and planning lessons;

5) Classroom Development: implementation of didactic-pedagogical activities in the classroom.

Brazilian researchers in the field of Science Education have studied these stages intending to increasingly guide activities in school education and teacher training processes. For example, Milli, Solino, and Gehlen (2018b) organize certain aspects of the Preliminary Survey through Discursive Textual Analysis (DTA) (Moraes & Galiazzi, 2011) to assist in understanding the information presented by the community; Santos and Gehlen (2020), concerned with the process of legitimizing limit situations, develop the Dialectical-Axiological Instrument (DAI) to aid in the selection, analysis, and legitimization of significant speeches in the Decoding stage.

In the Thematic Reduction stage, some studies seek to better understand and operationalize the process of selecting knowledge, scientific content, and actions necessary to understand and overcome the Generative Theme. For example, Demartini and Silva (2021) and Silva (2004) research the Thematic Network from "[...] problematization of selected speeches, identifying tensions between the present knowledge about the local reality – that records relational analyses of the micro and macro social organization carried out by the school community" (Silva, 2004, p. 203).

After the construction of the Thematic Network, research has pointed out the need for the Thematic Cycle with the aim of transposing elements of the network into the curriculum, especially in the organization of Teaching Units (Milli et al., 2018a). The Thematic Cycle allows for a critical understanding of the causes and consequences of social contradictions highlighted in the Thematic Network, as well as enables the unveiling of possible actions aimed at overcoming limit situations linked to the Generative Theme.

Furthermore, in the Thematic Reduction stage, it is possible to plan didactic-pedagogical activities, such as classes guided by the dynamics of the Three Pedagogical Moments (3MP) (Delizoicov, Angotti, & Pernambuco, 2011), namely: Initial Problematization, Organization of Knowledge, and Application of Knowledge. This dynamic has also contributed to structuring curricula that involve the collective participation of different subjects from the school and local community (Centa & Muenchen, 2016).

In summary, reinterpretations and contextualization of the stages of Thematic Investigation - in obtaining Generative Themes - have proven to be viable for the planning and implementation of school activities, especially in Science Education, in the face-to-face context. Based on these possibilities and considering the pandemic context, a teacher training process was developed remotely, with some adaptations in Thematic Investigation for obtaining Generative Themes when considering remote activities.

Methodological pathways

The research was conducted in the LEdoC program at UFRB within the scope of PIBID and in partnership with the GEATEC/UESC group[4] and the GIEQ/UFSC group[5], with a focus on the formative process, titled

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[4] GEATEC Group which has developed teaching-research-extension activities in municipalities in southern Bahia, with Paulo Freire as a reference.
[5] GIEQ Group which, despite the emphasis on Chemistry Teaching, has an interdisciplinary nature with researchers and teachers from various areas of knowledge.

'Thematic Investigation and the rural reality: challenges and possibilities for a Scientific Education in the Countryside,' conducted between March and July 2021. The activities totaled 48 hours with 9 synchronous meetings and 7 asynchronous ones, involving: 3 PIBID Coordinators (Higher Education Professors); 6 Supervisors (Basic Education Teachers); and 48 LEdoC students (with qualifications in both Natural Sciences and Mathematics). The participants were distributed among six Basic Education schools, each corresponding to a PIBID nucleus, located in different municipalities in the interior of the state of Bahia.

Given the pandemic context, the activities were conducted remotely through video calls (via Google Meet) and other resources such as Google Scholar, Google Drive, Google Classroom, Google Forms, and the WhatsApp messaging app. Additionally, it was necessary to adapt the Thematic Investigation process.

The Preliminary Survey stage was organized according to the dynamics of DTA (Milli et al., 2018b), where information (photos, reports, and narratives) about the local reality of each nucleus was brought by the participants and made available in a Google Docs file. No visits[6] were made and no informal conversations with community residents, which is why only the information from the PIBID participants and their supervisors was considered. Throughout the virtual meetings, the information was discussed and collectively organized into thematic groups. During these discussions, participants' statements emerged indicating other aspects of the local reality beyond those presented in the Preliminary Survey stage. These statements were then transcribed and inserted into these thematic groups.

The Encoding moment took place in a simultaneous sharing file (Google Docs), where significant statements from each thematic group were selected and discussed based on some criteria suggested by Silva (2004), such as the presence of frontier understandings of some participants about the reality they live in. For Decoding, the Dialectical-Axiological Instrument (Santos & Gehlen, 2021) was used, in which statements were analyzed based on values or their absence and limit situations related to social contradictions. Based on the tensions between the statements, values, and limit situations identified in each thematic group, general syntheses were carried out, resulting in Generative Themes.

In the Thematic Reduction stage, the Thematic Cycle (Milli et al., 2018a) was used to discuss and list the causes and consequences of the problems synthesized in the Generative Themes and possible alternatives to overcome them. This moment provided the organization of Teaching Units, based on the content, knowledge, concepts, and practices necessary to understand the revealed social contradictions. Additionally, lesson plans were developed, which can be implemented by participants in their teaching locations, using the 3MP (Delizoicov et al., 2011). Table 1 presents a synthesis of the stages of Thematic Investigation carried out during the remote training process in the PIBID activities.

The information was obtained through semi-structured interviews (Table 2) conducted with 5 (five) PIBID supervisors — some with backgrounds in Mathematics and others in Biology — who actively participated in the training process and work in rural schools in the Bahia region. They were chosen to participate in the interview because they have a general overview of the problematic situations in the local realities due to their relationships with both the school and local community subjects. To preserve the supervisors' identity, they were identified as: S1, S3, S4, and S5.

The analysis of the interviews was conducted through DTA (Moraes & Galiazzi, 2011), following the stages: Unitarization: the analysis corpus (comprising the interview transcripts) was organized, allowing the systematization of units of meaning; 'Categorization': these units were grouped based on semantic approximations, enabling the construction of the following categories: 'Theoretical-methodological and technological aspects for remote ethical-critical training and Knowing the local reality through the eyes of the other and transforming it together even when distant' and 'Metatext: discussion of the categories in light of the Freirean framework'.

Table 1. Stages of Thematic Investigation developed remotely.

Stages of Thematic Investigation carried out in the Remote Training Process
1. Preliminary Survey Asynchronous Moment: — Search for information about the community and school, through local newspapers and images (PIBID participants and supervisors); — Organization on Google Docs via Google Drive; Synchronous Moment: — Discussion about the presented information;

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[6] In person, investigation in the local community is carried out through visits and informal conversations with residents and representatives of public authorities.

— Synthesis of the understandings of the undergraduate students and supervisors about the community, through DTA (Milli et al., 2018b).
2. Encoding Synchronous Moment: -Analysis of the material and construction of groups by similarity, via Google Docs on Google Drive (initial categorization); Asynchronous Moment: - Supplementation of information; - Renaming of categories (titles of information groups); - Supplementation of categories with participants' statements (done after the transcriptions made by GEATEC) - Selection of significant statements based on criteria proposed by Silva (2004).
3. Decoding Asynchronous Moment: — Selection of significant statements based on Silva (2004); Synchronous Moment: — Legitimization of significant statements through IDA (Santos & Gehlen, 2021; Santos, 2020); — Obtaining the Generative Themes.
4. Thematic Reduction Synchronous Moment: — Use of the Thematic Cycle (Milli et al., 2018a); Asynchronous Moment: — Complementation of the Thematic Cycle; Synchronous Moment: — Organization of Teaching Units and Lesson Plans.
5. Classroom Implementation — Resumption of face-to-face classes in 2022; — Participation of the school supervisor; — Accompaniment by GEATEC.

Source: Research data.

Table 2. Semi-structured interview guide.

1-	What were your overall impressions of the training process?
2-	In the activities carried out within the PIBID context, how have you been working on the process of choosing content and activities to be developed in the classroom?
3-	In your opinion, what are the contributions of starting from the students' reality to the teaching-learning process, based on the dynamics developed in the training process?
4-	What are the main challenges in dealing with Remote Teaching? What are the main limitations and possibilities of the training process happening remotely?

Source: Research data.

Results and discussions

Theoretical-methodological and technological aspects for a remote ethical-critical formation

The researchers' approach to a particular community evokes a series of obstacles and suspicions, among them, considering a dialogical-problematizing educational perspective, the dangers of cultural invasion stand out, where the "[...] invader reduces the men of the invaded space to mere objectives of his action" (Freire, 1983, p. 26). In this sense, it is fundamental that a dialogical-problematizing formative process be collectively and dialectically constructed among the different participating subjects, constituting itself as a circle of culture (Freire, 1983).

In the context of the formation organized by GEATEC, all the subjects involved had space and opportunity to express themselves about how each meeting could be, and in the end, there was a moment of general reflection on the formative process. These moments of evaluation and reflection, which necessarily include self-assessment and self-reflection, were essential for understanding the participants' perceptions regarding the purposes, methodology, and resources used in the formation. According to supervisor S6:

> Each nucleus had the opportunity to discuss what was accomplished during the semester, and what was interesting was that everyone highlighted the training provided by GEATEC [...] they understood the methodology well and spoke highly of what was worked on. In particular, I say Ipuaçu, because they got to know the district more, so we already had a certain understanding of what we were working on for the Reality Inventory, and with the formation of GEATEC, they got to know more, you know, they did a more detailed study (S6).

The appropriation of Freirean theoretical-methodological assumptions, used in the training, can be identified when S6 makes an association between the Preliminary Survey stage and the Reality Inventory.

However, this initial stage is limited to obtaining characteristic information about the local reality, with the didactic-pedagogical work based on this information being a demand in the LEdoC course at UFRB.

Understanding the local reality proved to be one of the greatest challenges for remote training proposals based on Thematic Investigation, due to social distancing recommendations, which made visits to localities and contact with a wider variety of subjects unfeasible (Araújo et al., 2021). Thus, the participants in the training process, both PIBID students and supervisors, constituted themselves as representatives of the community as well as subjects engaging in transformative praxis (Freire, 2000).

The information for recognizing the local reality was brought by the participants of the training, through an activity where they could present photos, videos, reports, and accounts about important social and educational aspects for understanding local social contradictions. According to S4, the focus on the relationship between social and educational issues in the Preliminary Survey allowed for progress towards a more critical understanding of reality.

> The formative process was developed in a motivating way, leading the students to delve into the study of the region where they carry out the PIBID projects, drawing a parallel between the research conducted and the reality of the locality. This progress was significant for the development of enjoyable and consistent classes (S4).

The residents of a particular locality relate to each other and to the world dialectically, as this relationship allows for a critical unveiling of reality, enabling the praxis of liberation (Dussel, 2002). Guiding a formative process towards the realization of liberating praxis requires including significant aspects of local reality in the objectives and educational practices of the students, as highlighted by S4.

The role of the educator is related to the development of an ethical and critical perspective on the community in which the students are inserted, dialoguing with popular wisdom and promoting the transformation of reality, both in research and training activities and in didactic-pedagogical practices (Demartini & Silva, 2021). These ethical-critical principles guided the training with the PIBID scholarship holders, where technological resources allowed for the realization of problematizing dialogues remotely, as emphasized by S1:

> You came to show me that it is possible to do collective construction remotely, so for me, that was the main learning [...] because the mediation, while being light, calm, and enjoyable, managed to extract the necessary information from us, you know?! So it served as a model for me, as a teacher and mediator of the PIBID, it served as a model for the PIBID students, who are, for example, at this moment organizing a training session with the teachers at the school, and the starting point for the PIBID students is the GEATEC training (S1).

The collective and collaborative work, as highlighted by S1, indicates the importance of being in contact with other educators who understand the essence of a liberating praxis because "[...] teachers who want to transform their practice can benefit immensely from the support of such a group" (Shor & Freire, 1986, p. 20). Despite the limitations of remote training sessions, digital platforms enabled the meeting of different educators, geographically distant, with diverse ideas, values, experiences, and proposals, forming a network of inspiring educational dialogues and hopeful prospects for the implementation of liberating education in times of pandemic (Imberti et al., 2021). These positive aspects of virtual participation are emphasized by S6:

> [...] because it was not in person and occurred remotely, I would say that it was good, very good, this interaction between universities, between the world [...] the internet connection brought us closer and expanded our possibilities to participate in various events and to be connected in two, three places at the same time, today this is possible, right (S6).

Reports like those from S1 and S6 reveal that the experience of the training process in PIBID can provide a space for the development of teachers conscious of their ethical-critical role, where there is recognition that critical teaching activity requires ongoing training (Demartini & Silva, 2021). Furthermore, in the words of S1, the training was characterized as an opportunity to discuss alternatives to synthesizing theory and practice, reflection, and action in the educational process:

> [...] what we observe is that people make a lot of references to Paulo Freire [...] but in the exercise itself, in practice itself, we cannot see it. So, it is like something philosophical, something you identify with, but something you do not put into practice. And you came with a totally different proposal, which is to make this Freirean thinking a practice, to make it become a plan (S1).

Freire (1987) explains that prioritizing theory over action results in inauthentic words, whereas privileging action over theory leads to purposeless activism. Liberating praxis is precisely the synthesis of theory and

practice, action and reflection, with understanding this dialectical dynamic being essential for appropriating the dynamics of Thematic Investigation and its implementation in other contexts (Demartini & Silva, 2021).

In 'normal' times, without the educational complications caused by the pandemic, developing a teaching activity where theory and practice are in balance posed a challenge. With remote teaching, these challenges have grown, especially due to the emergency use of digital technologies and the sudden immersion in virtual learning environments (Souza, 2020). In this context, difficulties were reported in the PIBID training process, some intrinsic to the technologies used for remote meetings, as highlighted by supervisor S6:

> Among the main difficulties, internet access certainly stands out. Sometimes, even our connection is not reliable, let alone our students', considering their distant locations and the quality of their Wi-Fi connections, not to mention the financial aspect of having a data plan available for the family or even the device to connect. There are virtual meetings where, depending on the weather, they cannot join. Some days the internet works, other days it is unreliable, so we end up communicating more through WhatsApp, which becomes the primary tool for remote teaching (S6).

Given that it is a training involving rural subjects, issues with access to and use of digital technologies are associated with the challenge of remote locations from urban centers, where internet service is often poor or unavailable. Souza (2020) emphasizes the importance of the socioeconomic context in understanding educational challenges during the pandemic, presenting data indicating that a significant portion of the Brazilian population lacks internet access, and in households where there is the internet, the cellphone is the primary device used, and in many cases, the only device shared by the family. These difficulties are reported by S3, who describes their experience with remote teaching in Basic Education:

> For me, what is difficult is that even though I am here with my very good cellphone, I have a laptop, I have good internet [...] a microphone, headphones to not interfere too much with my communication, a good environment, but 99% of my students do not experience this. So I might be prepared for them, but they are not prepared for this reality (S3).

These difficulties have affected all levels of education in Brazil, from basic education to higher education (Souza, 2020). In the case of the LEdoC course at UFRB, some students and teaching interns come from humble families, who live off what they produce on the land and, in many cases, cannot afford to pay for internet service, a cell phone, or a computer for them to participate in remote classes. This reality has led teaching interns and supervisors to seek increasingly difficult alternatives to be developed, both to continue the activities required in the PIBID and to meet the demands of basic education. Professor S5 highlights an example of this situation:

> Here, in my community, not even remotely, because the activities, we were doing through the delivery of worksheets [...] It was only through the construction of worksheets, so we were following the school's schedule, and the textbook, but we didn't know the students. So we kept doing it the same way, constructing the worksheet without having access to the students (S5).

As indicated by S5, educators reached a point where they did not have many alternatives to break away from traditional education. Moreira and Schlemmer (2020) emphasize that the lack of preparation for the use of digital technologies in education led teachers to reproduce the principles of traditional education in remote teaching, such as: focus on content; two-way communication; lecture-based classes; teacher-centered approach over student-centered learning; and transmission of information.

To contribute to overcoming a banking education (Freire, 1987) in virtual environments, during the training developed by GEATEC, in partnership with coordinators, supervisors, and PIBID scholars from LEdoC, alternatives were presented for the implementation of an ethical-critical education in a context of social isolation. Participants in the training process generally did not report difficulties with the methodology used or regarding the Freirean political-pedagogical aspects discussed as guiding principles for their training and as a proposal for implementation in PIBID activities. The difficulties faced during training reveal that the lack of structure for remote teaching is a consequence of governmental negligence and social inequalities.

> I think here, for the reality of the municipality of Feira de Santana, the main difficulty was the lack of resources because we ended up having to make do with what we had, each one with their limitations of the network, with their limitations of the equipment. Those who did not have them had to arrange to get something done because the municipality did not provide support either for the teacher or for the student (S1).

Such considerations and findings reinforce Freire's thesis that it is not enough for educators to limit themselves to their teaching functions; it is necessary to recognize and exercise their social and political role

in the fight for social justice (Freire, 2000). Transformations in educational practices, based on emancipatory theoretical and methodological contributions, are an important front in this struggle, but acting beyond the school walls is fundamental and urgent so that the guarantee of education with epistemic, social, and political quality is not compromised, especially in a pandemic reality (Araújo et al., 2021).

In summary, the reports presented by the supervisors showed that despite technical problems, lack of resources for remote teaching, and exacerbated social challenges during the pandemic, it is possible to resist and build an ethical, critical, and transformative educational proposal. In this aspect, the educators participating in the training emphasized the importance of appropriating Freirean theoretical-methodological assumptions in integrating social issues into the educational process, considering the particularities of the local reality and the insertion of popular wisdom, ideas, values, and experiences of local communities in the process of remote teaching and learning.

Knowing the local reality through the eyes of others and transforming it together even when distant

The interviews conducted with the supervisors provided insight into the implications of the course for both the initial (PIBID students) and continuing (supervisors) education of the participants in the process. Among the emerging issues, it is noteworthy that the local reality, as a pedagogical starting point, is an important element for the development of education with meaning and significance for the learners. The realization of this conception of education inseparable from the historical-cultural issues of the learners, highlighted by the supervisors, is supported by the theoretical-methodological assumptions of Freire, in which dialogicity and problematization guided the construction of conscientizing activities and practices.

According to Stoeberl and Brick (2021, p. 4), the moment of dialogue in the initial problematization allows the researcher to address the "[...] intersubjectivity of the coded local reality [...]", that is, the dialogue of initial problematizations enables the communication of consciousness about the local reality, often seen from a critical perspective. This was evidenced in the statement of S5, highlighting that the formative process:

> [...] contributed a lot to our education, and also to this construction, together with the teacher, and knowing their difficulties was very important because we were seeing our community also from different perspectives and seeing our students from different perspectives, which greatly contributed to our learning, they were very enriching moments (S5).

S5's account indicates an understanding that the activities developed in the training are not merely "[...] a methodological question [...]", but an ethical-critical stance in recognizing the other as "[...] a co-builder of their reality" (Stoeberl & Brick, 2021, p. 5). Thus, it is understood that the dialogical-critical process contributed to collaborative participation both in the development of knowledge and in the transformation of reality. The training process allowed different understandings of the same reality, generating tensions among them. In this context, S5 emphasizes that it is not enough to know the locality; critical reflection is necessary, through dialogue and problematization, to arrive at Generative Themes.

> [...] we knew that there were (several themes) in our community, but we did not stop to think about them, or worry about that theme, or think about it on a larger scale, leading us to reach our Generative Theme... A Generative Theme that is necessary both for our training and for the students in our community, because through our students, the whole community recognizes itself as quilombola and learns to embrace their color and understand their place in society (S5).

Freire (2005, p. 112) emphasizes that the Generative Theme enables/awakens individuals to unveil the world since the critical analysis of a given "[...] significant-existential dimension enables individuals to adopt a new, also critical, posture in the face of limit situations." That is, the understanding of reality is dialectically reconstructed through denunciations of social contradictions and announcements of possible means for overcoming them. In addition to the aspects involving subject-world relations mentioned by S5, the accounts of S6 reinforce that when everyday experiences are the guiding axes of the educational process, there is a much more meaningful exchange:

> [...] they were able to speak from their own experiences, from what they live and with authority, right! The activities developed for the nucleus, we could observe that they always contribute to their reality. When it was the people from the quilombola region, and also close to the river, they also have this reality of fishing [...] quite similar, what we discussed, and they contributed a lot by talking about their reality, what they already knew, it is more comfortable to speak about what they know (S6).

According to S6, some principles that constituted the formative process characterized it as a significant experience, for example: the possibility of sharing experiences and life stories; focus on local historical and cultural issues; and the collective construction of knowledge. According to Centa and Muenchen (2016), participation, within the scope of Freirean pedagogy, is a fundamental element for the constitution of democratic educational spaces, as it enables the formation of individuals aware of decision-making processes not only in the school context but also in society as a whole. These issues are mentioned by S1 as follows:

> The microphones that were previously turned off, the cameras, they do not turn on, I do not even care anymore, but the [student's] microphone which was usually turned off, and then when you propose to study something local, he knows about that, he knows the reality, so when asked he turns on the microphone and speaks. So, he stopped being a mere spectator who was there in the class only listening, and started participating much more, right? It is because, as I am telling you, it is something he knows about, that he wants to talk about (S1).

The statements presented by S6 and S1 reveal the importance of reality being the starting point for the pedagogical process, where there is more participation, contributions, and involvement of the individuals. The Thematic Investigation process enables the incorporation of the thoughts and languages of the subjects into the curriculum content (Stoeberl & Brick, 2021). In summary, dialectical elements in the construction of meaningful knowledge are related to popular wisdom, values, and scientific concepts, which should be subordinated based on the social demand of the community (Milli et al., 2018a).

Another fundamental dialectical dynamic in the construction of meaningful knowledge is established between educator and learner, with the educational process being "[...] an act of communication in which the educator and the learner are mediated by the world, curious and supportive, both learning and teaching and understanding the historicity of knowledge" (Demartini & Silva, 2021, p. 5). Knowing that the formative process coordinated by GEATEC was developed in the context of a teacher initiation program, S1 emphasizes that the subjects of education do not occupy fixed positions, since the learner may become an educator in the future:

> I am sure that they are multipliers, that while they talk about what is happening, and we come to a solution for these local problems, these local problems and their solutions will be put into practice. It may be minimally, it may be at home, but I am sure that they will be multipliers, that they will know how to speak, they will know how to do and pass on this knowledge to others in the community. So I have no doubt about that, that it will move forward and that it is a one-way path, because, as I am telling you, everything gains meaning (S1).

The aspects highlighted by S1, regarding Thematic Investigation, provide educators (PIBID students and teachers from Basic Education) with a differentiated perspective on the curriculum content, demonstrating that from the training process, limit situations became the starting point in the planning and development of activities in the discipline where S1 works. The collective constructions and searches, facilitated by the Thematic Investigation process, trigger greater involvement of teachers and students in the teaching-learning process (Milli et al., 2018b).

In summary, supervisors emphasized that the focus on local reality was one of the most important aspects of the training, as it provided a space for listening to others and expressing their own experiences and perspectives on the locality in which they are inserted. Thus, developing the Freirean theoretical-methodological perspective through Thematic Investigation enables the socialization of different perceptions of the same reality. Moreover, this proposal allowed participants to engage in discussions that facilitated new insights into local reality, highlighting a "[...] common effort of awareness of reality and self-awareness" (Freire, 1987, p. 57), as a fundamental axis for the development of educational actions, favoring the process of awareness regarding situations that were once veiled and therefore naturalized by the local community and school.

Final considerations

The interview conducted with the supervisors of the PIBID program at LEdoC/UFRB revealed some perceptions about the implications and contributions of the training activities, such as the importance of the local reality and the theoretical-methodological assumptions of Paulo Freire being allied to the educational process, highlighting some possibilities and limitations of obtaining Generative Themes remotely. Regarding the possibilities, the supervisors emphasize the use of technologies as facilitators of the collective construction process of knowledge, the interaction between different spaces (School-University), and the

relevance of having the local reality as a starting point in the teaching-learning process to promote/stimulate the participation and involvement of the subjects (Delizoicov et al., 2020; Freire, 1987).

As for the limitations, the supervisors highlight some difficulties in accessing the internet, especially for the PIBID participants who live in areas where climatic conditions affect its proper functioning, and limitations of equipment for remote classes. The pandemic has highlighted digital exclusion, and Brazil needs public policies for digital inclusion, as social inequality implies access to equipment (Cardoso et al., 2020). However, in some cases, digital technologies can be an allied tool in conducting dialogues and problematization between subjects from different geographical and cultural realities. According to Souza (2020), it is necessary to experience practices and methodologies that explore the potential of digital technologies to enable the collective/collaborative construction of teaching and learning, also advocating for public policies that enable access to technologies/internet.

Finally, it is worth highlighting that the formative process carried out in the PIBID program at LEdoC, based on Paulo Freire's perspective, constitutes an innovative activity for both the participants and research in Science Education, developed within a higher education institution to deal with the social isolation brought about by COVID-19. Innovative for the participants (researchers, supervisors, and PIBID participants) because they had the opportunity to learn and experience the process of obtaining Generative Themes, engage in dialogue with colleagues from various locations, and appropriate digital tools, which contributes effectively to access to knowledge, as well as equity.

At the research level, this formative experience represented an innovation in how to select Generative Themes in a context full of restrictions due to the pandemic, such as the use of the Dialectical-Axiological Instrument (Santos & Gehlen, 2021) in the synthesis and legitimization of significant speeches. The development of Thematic Investigation becomes feasible in a remote context; however, ways must be sought for more direct contact with the community so that community representation is not limited only to directly involved participants, in this case, PIBID participants and supervisors. Contact with the community, even if through digital means, becomes a means of dialogue and understanding of the other's reality, becoming the basis for social transformation, assuming the socio-educational and pedagogical commitment that Freirean education proposes (Centa & Muenchen, 2016; Imberti et al., 2021).

Acknowledgements

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