ACTA SCIENTIAE

ISSN: 2178-7727
DOI: 10.64856/acta.scientiae.8309

Formative Itinerary Notebook of Rural Education: intents through Mathematics Education

Luciana Boemer Cesar Pereira[a]
Beatriz Fernanda Litoldo[b]
Cristiane Pessoa[c]

[a] Universidade Tecnológica Federal do Paraná, Campus Dois Vizinhos, PR, Brasil
[b] Universidade Federal do Triângulo Mineiro, Instituto de Ciências Exatas, Naturais e Educação, Departamento de Educação em Ciências, Matemática e Tecnologias, Uberaba, MG, Brasil
[c] Universidade Federal de Pernambuco, Centro de Educação, Departamento de Ensino e Currículo, Recife, PE, Brasil

ABSTRACT

Context: The elaboration of didactic materials designed for Rural Education has been among the initiatives of State Department of Education of Paraná; however, the need for deepened investigations that allow to understand the formative propositions and intents in those materials regarding rural people still remains. The present research finds its purpose from that context. **Objectives:** To understand the proposed dialogues in the formative itineraries of Rural Education between the social/traditional practices and Mathematics in Paraná context. **Design:** A qualitative research of document type was adopted. **Environment and Participants:** The Formative Itinerary Notebook – Rural Education, of Paraná state – was selected to be analysed. **Data collection and analysis:** The data were produced, organized and analysed through Teorema System, which is structured in three stages: planning, material exploration and data treatment. **Results:** Considering the performed analyses, it is observed that, although the Formative Itinerary Notebook proposes the articulation between Mathematics and Rural Education social practices, the approaches of technologist character predominate, with isolated insertions and not structured from critical perspectives, such as the Critical Mathematics Education and the Ethnomathematics. **Conclusions**: The analysed material reveals fragilities in the articulation of its pedagogical intents and the Rural Education political and epistemological principles, demanding redirections that promote a truly emancipatory education, grounded on the recognition, valorization and dialogue regarding rural people's knowledge, experiences and struggles.

Keywords: New High School; Paraná; Critical Mathematics Education; Ethnomathematics; Financial Education.

Corresponding author: Luciana Boemer Cesar pereira.
Email: lucianapereira@utfpr.edu.br

Caderno de Itinerários Formativos da Educação do Campo: intencionalidades por meio da Educação Matemática

RESUMO

Contexto: A elaboração de materiais didáticos direcionados à Educação do Campo tem figurado entre as iniciativas da Secretaria de Estado da Educação do Paraná; entretanto, permanece a necessidade de investigações aprofundadas que permitam compreender as proposições e intencionalidades formativas presentes nesses materiais no que se refere aos sujeitos do campo. É diante deste contexto que esta pesquisa encontra sua motivação. **Objetivos**: Compreender os diálogos propostos nos itinerários formativos da Educação do Campo entre as práticas sociais/tradicionais e a Matemática, no contexto do Paraná. **Design**: Adotou-se uma pesquisa qualitativa do tipo documental. **Ambiente e participantes**: Foi selecionado para análise o Caderno de Itinerário Formativo – Educação do Campo, do Estado do Paraná. **Coleta e análise de dados**: Os dados foram produzidos, organizados e analisados por meio do Sistema Teorema que é estruturado em três etapas: planejamento, exploração do material e tratamento dos dados. **Resultados**: Diante das análises realizadas, constata-se que, embora o Caderno de Itinerário Formativo proponha a articulação entre a Matemática e as práticas sociais da Educação do Campo, predominam abordagens de caráter tecnicista, com inserções isoladas e não estruturantes de perspectivas críticas, como a Educação Matemática Crítica e a Etnomatemática. **Conclusões**: O material analisado revela fragilidades na articulação entre suas intencionalidades pedagógicas e os princípios político-epistemológicos da Educação do Campo, demandando reorientações que promovam uma formação verdadeiramente emancipatória, fundada no reconhecimento, valorização e diálogo com os saberes, experiências e lutas dos sujeitos do campo.

Palavras-chave: Novo Ensino Médio; Paraná; Educação Matemática Crítica; Etnomatemática; Educação Financeira.

INTRODUCTION

The High School Reform, established by Law No. 13.415/2017, which amended the Law of Guidelines and Bases of National Education (LDB) made several structural changes, among them the expansion of school hours and a new curricular organization (Silva, 2018). So, the New High School curriculum is now composed of National Common Curricular Base - BNCC (Brasil, 2018) and the Formative Itineraries (Brasil, 2017).

Regarding the terminology 'Formative Itineraries', Teixeira, Leão, Domingues and Rolin (2019, p. 59) propose a study aiming to "present an analysis on the conception of "formative itineray" term in the new legislation proposition of High School, which was recently approved, and its understanding in the previously published institutional documents". In that

sense, the authors conducted a documentary study concerning the Resolution CNE/CEB No. 06/2012 and the Law No. 13.415/2017.

According to Teixeira et al. (2019), the 'Formative Itineraries' term is not new in Brazilian regulations. It is already mentioned in Resolution CNE/CEB No.06 of September 20th, 2012, which defines the National Curricular Guidelines for Technical High School Education (Brasil, 2012). The authors point out that the 'itinerary(ies)' term is mentioned in the document several times, which shows special attention given to that word. They state that the "discussion on the construction of coherent formative itineraries may be important for a teaching institution involved with professional education" (Teixeira et al., 2019, p. 61). That observation is also highlighted by Alves and Carvalho (2022), who mention that the formative itineraries were already provided in the updating of National Curricular Guidelines of High School – DCNEM – under CNE/CEB No. 5/2011(Brasil, 2011).

According to Alves and Carvalho (2022), the idea was to provide

> [...] the offer of appropriate time and space for studies and activities, allowing diversified optional formative itineraries. The presented objective in the guidelines proposes to better respond to heterogeneity and plurality of conditions, to students' multiple interests and aspirations at their age, social, cultural specificities and their developing stages (Alves & Carvalho, 2022, p. 88).

Therefore, in that context, 'itinerary' refers to paths, routes or tours, i.e., a description of the path to be followed in the sense of movement, whereas 'formative' refers to something that forms or serves to form, contributing to form or educate someone or something (Teixeira et al., 2019). This way, the understanding of Formative Itineraries, according to CNE/CEB No. 06/2012, is, as Teixeira et al. (2019) state, the indication of

> [...] possible ways a student may follow during their academic and educational life. It is the set of stages that compose the organization of the Professional Education offer by the Professional and Technological Education institution, in a determined technological axis, favouring continuous and articulated achievement of studies and professional experiences, properly certified by legalized educational institutions. The formative itinerary contemplates the sequence of possibilities that can be articulated within the offer of

> Professional Education courses, programmed from studies related to profissionalization itineraries in the world of work, to social and occupational structures and to scientific and technological foundations of productive processes of goods and services, which guide and configure a consistent educational background (Teixeira et al., 2019, p. 61).

Considering that, Teixeira et al. (2019) mention that such terminology gained attention in the Law No. 13.415/2017, showing its permanence in the educational vocabulary, but with a new meaning. The text in Article 36 of that Law presents a reformulated concept of Formative Itineraries, which now "will have to be organized through the offer of different curricular arrangements, according to the relevance for the local context and the teaching system possibility" (Brasil, 2017, art.36), with emphasis on the following knowledge areas or professional performance: I – Language and its Technologies; II – Mathematics and its Technologies; III – Natural Sciences and their Technologies; IV – Human and Social Applied Sciences; and V – Technical and Professional Education (Brasília, 2017).

According to information from the portal of Education Ministry (Brasil, 2025, *site* [1]), the Formative Itineraries may be organized from different knowledge areas, as well as from Technical and Professional Education (FTP), favouring the articulation between High School and Technological and Professional Education (EPT). Such itineraries comprehend a diversified set of formative experiences, such as disciplines, projects, workshops and centers of study, through which students may deepen their knowledge in one or more areas, with or without integration to technical education. Besides, teaching networks have autonomy to define the itineraries that will be offered, and they must consider the local specificities and promote the school community participation in the decision process. The legislation also provides the possibility for the student to take more than one itinerary, as long as there is availability of vacancies in the teaching system.

In Paraná state context, apart from the Formative Itineraries proposed by the Law No. 13.415, a Formative Itinerary Notebook was also elaborated and became available specifically for Rural Schools, which shows integration

[1] Site link: https://www.gov.br/mec/pt-br/assuntos/ept/iftp-itinerario-da-formacao-tecnica-e-profissional. Accessed on: May 08, 2025.

between the areas, as it is proposed by the Law in its Article 36, 3rd item (Brasil, 2017). Such Notebook is presented as a Formative Itinerary that seeks to

> [...] contemplate the people who live in the country in their specificities, their interests, their identity, which covers several social categories, such as: *faxinalenses*, small rural owners or farmers, riverside people, rural workers, landholders, day laborers, islanders, people who were affected by dam construction, leaseholders, as well as artisan fishermen, camped and settled, who have their own itineraries (Paraná, 2023, p.08).

So, whatever was pointed in the Notebook presentation corroborates the Law of Guidelines and Bases of National Education (LDB) (Brasil, 1996, [2023], Art.28), which proposes that "the teaching systems will promote the necessary adaptations to their adequation to rural life and to each region particularities [and] appropriate methodologies to real needs and interests of rural school students with possibility of use."

Furthermore, Paraná state also has Curricular Guidelines for Rural Education (DCEC) (Paraná, 2006), which lead the rural school teaching to be close to rural people's reality, because "what characterizes rural people is the particular way they relate to nature, the work on the land, the organization of productive activities, through family members' labour, their culture and values" (Paraná, 2006, p.26).

Therefore, it is observed that the official documents, such as Law of Guidelines and Bases of National Education and Curricular Guidelines for Rural Education, corroborate the formative itinerary in the sense that the material must be designed to meet the Rural Education specificities. However, some reflections must be directed and pondered when analysing those documents, specially in the sense of understanding the dialogue possibilities between the Formative Itineraries and the Rural Education in Mathematics Education scope.

When discussing such dialogues, the social/traditional practices that are the core of Rural Education are highlighted; they propose to build a relation between the conception of world, school, contents, teaching and assessment methodologies (Paraná, 2006). That is due to the fact that the population who lives in the country needs a school that provides and promotes knowledge improvement by using its punctual and specific reality, not just as a starting and finishing point for teaching and learning processes, but, beyond that, it must be

intrinsically connected to all its development, having as the ultimate purpose a historic universality of its knowledge (Caldart; Pereira; Alentejano & Frigotto, 2012). To this end, it is essential that the adopted methodological strategies enable school contents to be close to the rural lifestyle.

Regarding the social/traditional practices, according to Oliveira, Gonçalves and Silva, Gonçalves Junior, Garcia-Montrone and Joly (2014), it is assumed that they

> [...] result from and create interactions among individuals and between them and the natural, social and cultural environments where they live. They are developed within groups, institutions, with the purpose of producing goods, transmitting values, meanings, teaching how to live and how to control life, at last, keeping the material and symbolic survival of human societies (Oliveira, et al. 2014, p. 33).

Facing what was exposed, the present text[2], that focuses Financial Education and the Integration between Mathematics and Natural Sciences, shows results of an investigation whose objective is to understand the proposed dialogues in the Rural Education Formative Itineraries between the social/traditional practices and Mathematics Education in Paraná framework.

THEORETICAL FRAMEWORK

The High School Reform, known as New High School (NEM), has been the focus of a lot of questions regarding its real effectiveness in improving education quality. According to the legislation that established it, the proposition was to make curriculum more attractive, accessible and flexible, aiming to reduce the rates of evasion and failure (Brasil, 2017). In that context, Ferretti (2016) observes that historically, Brazilian High School reforms have focused mainly on the curricular structure and content, although other aspects such as financing, have also been contemplated.

Mendonça and Fialho (2020) point out that school faces the challenge of adapting to the transformations caused by the technological knowledge society, which have discouraged young people concerning traditional teaching. Besides, they emphasize school structure is still precarious, teachers are

[2] It is an article originally published in the annals of IX International Seminar of Research in Mathematics Education (Sipem/2024), which was expanded for the present publication, specially with the inclusion of analyses related to Financial Education curricular unit, presented in the Notebook.

underpaid and have insufficient initial and continuing education to face the challenges imposed by society. So, the New High School still needs a lot of deep structural changes that must be strongly discussed in order to effectively meet the needs of the present generation students.

In Rural Education, Costa (2023, p. 1), critically describes that the New High School was built grounded on "neoliberal policies and business groups" to meet "the impositions of capital and market, strongly attacking the perspective of human education and emancipation". He still complements that Rural Education is an education project that results from "fights and conquests led by country people in the context of fighting for land, which became effective in public policies" (Costa, 2023, p. 1).

In the same direction, Caldart (2021) points out that the capitalistic logic tries to show, in an ideological way, that agricultural business is focused on labor and nature exploration, because "the agricultural business owners have done an ostensible ideological work to make everyone believe – even the country families and the Rural Education collective subjects – that the "Development" of country agriculture depends on its insertion in the business logic" (Caldart, 2021, p. 358).

Alentejano and Egger (2021, p. 103-104) corroborate that criticism and state that the agricultural business "[...] increases social inequality, reduces job offers, contaminates food, soil and water to increase the production of commodities that are more and more controled by transnational corporations, whereas the area that is intended to produce food to Brazilians decreases". It is also important to point out that social and union movements, together with students, are contrary to the imposition of High School Reform and the Constitutional Amendment No. 95/2016 approval, which froze education investments for 20 years (Brasil, 2016). So, according to Brazilian Union of Secondary Students (Ubes, 2016), student movements carried out occupations in schools and universities, aiming to defend public education and fight against the imposed attacks by the ongoing reforms.

Considering the deepening of structural inequalities promoted both by the agricultural business logic and by the austerity policies, it is fundamental to problematize the way Financial Education has been appropriate in school curriculum, specially the one addressed to country people, as a dimension that can reproduce or contest that excluding logic.

According to Mazzi, Hartmann and Pessoa (2024), Financial Education must aim at the collective and solidary development, environmental and ethical

respect, searching for dignity of society minorities, historically explored. The authors state that discussing is not enough; it is necessary to fight against social inequality and injustice. To them, Financial Education is the capacity of reading how capitalism and neoliberalism[3] cause impact on social, environmental, political, ethical, esthetical and cultural human relations, proposing ways to fight and transform the injustices they produce, always moving toward social justice.

That critical conception of Financial Education converges directly with the Critical Mathematics Education (EMC) principles, when it proposes that mathematical contents teaching should be guided by the critical reading of reality and the promotion of social justice.

However, although it does not converge with the Critical Mathematics Education principles and it is aligned with Organization for Economic Co-operation and Development (OECD), the National Common Curricular Base (Brasil, 2018) states that in the area of High School Mathematics and its Technologies, "students must use concepts, procedures and strategies not only to solve problems, but also to formulate them, describe data, select mathematical models and develop computer thinking through the use of different area resources" (Brasil, 2018, p. 146). Still, it is necessary to problematize to what extent those guidelines have been effectively implemented in a critical way and situated in the curricular materials related to rural school contexts.

When applied in the Financial Education context, that guideline gains relevance because it allows students not only to understand mathematical concepts involved in financial situations, but also to use them to reflect on their

[3] Based on several theoreticians who discuss neoliberalism, Silveira (2009) characterizes it as a political and economic doctrine that reaffirms the values and prescriptions of classic liberalism. According to the author, that conception has global influence, reaching all continents; it values inequality, bases wealth on the financial market, and establishes as concrete measures, among others: monetary authority with predictable action, not cyclical; the Estate acts only in the few "consensus" areas among individuals and in themes that are considered indivisible, such as national defense and maintenance of law and order; extinction of policies for social welfare and exclusive provision of minimum income for indigent people; structural unemployment creation to weaken the union power and cheapen the production; free capital and goods flow among countries; privatization of everything that can be privatized; Estate fiscal adjustment to make the necessary primary surplus to pay the creditors; free exchange; independent central bank.

own economic reality and to expand their perceptions beyond Mathematics. Andrade and Selva (2024, p. 45) emphasize that "the financial decisions of rural young people and adults are strongly molded by their former experiences (*backgrounds*) and by future expectations (*foregrounds*), influenced by the social and cultutal contexts they are inserted in".

So, when Financial Education is approached in a critical perspective, it may contribute to an emancipating education, specially for rural people. It even becomes more relevant facing a New High School proposition that, as it has already been shown, favours a marketing and technologist logic, disconnected from the real needs of rural school community.

Besides, considering that Brazilian countryside has been systematically submitted to the agricultural business dynamics, the critical financial literacy may provide students with tools to understand and question the impacts of that model in their lives, their work and their community.

When inserted in an interdisciplinary way and dialoguing with country reality, Financial Education may also work as a bridge between school Mathematics and the daily challenges faced by country young people. The planning of agricultural production, the resource community management and the critical understanding of public policies are examples of practices that involve financial reasoning and can be pedagogically explored with sense and purpose.

In that sense, Securato's (2002) statement is corroborated when he defends that Financial Education must contribute to strengthen the individual as a transforming agent, and not just as an efficient consumer, which echoes the foundations of Critical Mathematics Education (EMC), as advocated by Skovsmose (2001).

The Critical Mathematics Education approach is able to respond to several demands related to education of students who are open to the world, protagonist, creative and critical. That perspective emphasizes the importance of reflecting about sociopolitical and socio-environmental questions, moving away from the Mathematics that is centered in memorization and formulas (Oliveira, 2024). Therefore, it is understood that the focus of educational process consists of understanding Mathematics as a means to act in the world. That action is directly related to the transformation of the society through the citizens' critical reflection (Skovsmose, 2001). The core of the idea is not focusing Mathematics – particularly Financial Education here – just with a utilitarian vision, but also considering it as a mirror that reflects and is sustained

in problems that are related to social situations and conflicts students face in their everyday life.

Complementary to the Critical Mathematics Education and in sync with the principles that guide the critical Financial Education and the Rural Education, the Ethnomathematics consists of an approach that seeks to understand, analyse and apply the mathematical knowledge in different sociocultural contexts (D'Ambrósio, 2002).

The Ethnomathematics, proposed by D'Ambrósio (2002), offers an integrating perspective of mathematical practices in different sociocultural contexts. In the countryside, it is an essential tool to understand and transform the reality when Mathematics is connected to everyday activities, such as cultivation, irrigation and resource management. That perspective values local knowledge and challenges the knowledge hierarchy, acknowledging alternate ways for reasoning and problem solving.

Historically, country populations have developed their own mathematical strategies for subsistence, commerce, community and financial organization, which enriches Mathematics teaching with traditional knowledge. Politically, integrating Ethnomathematics in school curriculum strengthens community autonomy and resists to educational models focused on agricultural business. Conceptually, it teaches country people Mathematics in a contextualized way, by using examples of everyday life, such as calculations of area and volumes, financial and reflection organization and sustainable practices (D'Ambrósio, 2002).

Therefore, Financial Education in rural schools, dialoguing with the Critical Mathematics Education and with the Ethnomathematics, strengthens the commitment to an education that not only acknowledges local knowledge, but also promotes autonomy, critical awareness and social justice. That perspective resists to the education business model and reaffirms rural school as a space of resistance and integral education. This way, opposing to technologist guidelines and business model that guide the New High School, those approaches reaffirm the role of rural school as a space of resistance, valorization of local knowledge and construction of future collective projects.

METHODOLOGY

The results presented here were obtained from an investigation developed by a subgroup of Brazilian Society of Mathematics Education – Working Group of Final Years of Elementary School (GT2 – SBEM). The research was conducted with accreditation at Federal Technological University

of Paraná, Dois Vizinhos campus, and it is already finished. The objective of the investigation was to understand the proposed dialogues in the Rural Education Formative Itineraries between social/traditional practices and Mathematics in Paraná. To this end, the research had a qualitative approach(Goldenberg, 2011), of documentary nature (Gil, 2002). According to this author, the documentary research "chooses materials [documents] that haven't had an analytical treatment yet, or can still be redesigned according to the objects of the research" (Gil, 2002, p. 45). It is highlighted that 'document' means each and every kind of written, statistical and iconographic material (Godoy, 1995).

For this investigation, the selected material to be analysed is *Formative Itinerary Notebook: syllabus of offered curricular units – Rural Education* (Paraná, 2023). The focus was on two specific sections of that material, according to the presented organization in the referred Notebook: (i) 'Curricular Units of Flexible Part', in the subsection 'Financial Education'; and (ii) 'Curricular Units of Flexible Part' related to Integrated Formative Itinerary of Mathematics and Natural Sciences. The choice of those excerpts is justified by the theme closeness of the third author to Financial Education, result of her researches, as well as the two first authors' teaching experience and investigation in Rural Education. Therefore, this section brings the analysis of 'Financial Education' Curricular Unit (Figure 1) and four other Curricular Units (Figure 2)[4].

Figure 1

Summary of the first selected section for the study (Elaborated by the authors from Paraná, 2023)

Curricular Units of the Compulsory Flexible Part			
Curricular Unit	Teaching Stage	Academic Load	Paging
Financial Education	High School: 1st, 2nd and 3rd years	2 weekly classes	12 - 36

[4] Beyond the Curricular Unit previously mentioned, the Formative Itinerary Noebook presents other working propositions that involve contents and/or objectives related to mathematical knowledge. In that context, 'Entrepreneur Cooperativism' and 'Cooperative Entrepreneurship' units are highlighted, both located in 'Curricular Units of Flexible Part' section, connected, respectively, to Languages and Human Sciences Integrated Formative Itinerary and to The Four Knowledge Areas Integrated Formative Itinerary.

Figure 2

Summary of the second selected section for the study (Elaborated by the authors from Paraná, 2023)

Integrated Formative Itinerary of Mathematics and Natural Sciences			
Curricular Unit	Teaching Stage	Academic Load	Paging
Biotechnology in Agriculture and Livestock Farming	2nd year High School	2 weekly classes	94 - 119
Mathematics e Robotics I	2nd year High School	2 weekly classes	120 - 145
Agriculture and Livestock Farming Facilities	2nd year High School	2 weekly classes	146 - 159
Energy applied in Agriculture and Livestock Farming	2nd year High School	2 weekly classes	160 - 176

As for methodological procedures, the Teorema System was used (Amaral; Mazzi; Andrade & Perovano, 2022). Although such System consists of a methodological procedure focused on Mathematics Textbook Analysis, it may be applied, adapted as necessary, to other kinds of documents, as in the case of the Notebook in question. The Teorema System was originally developed to analyse Mathematics textbooks. In the Planning stage, for example, the authors consider that it is up to the researchers to decide 'which books will be analysed' – considering some criteria, such as the Textbook Guide, the most used work in the country, the publisher, among others – and 'what to study', such as the Teacher's Guide, the assignments and/or the panel.

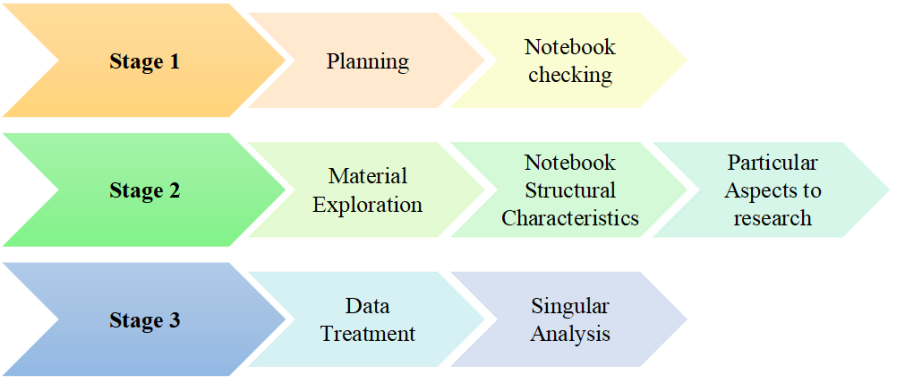
In the case of the present research, the adaptations of the System to the Notebook analysis resulted from the fact that there are no choices to be made concerning 'which books will be analysed', since none of the expected characteristics for the selection can be applied to the material in question (there is no Notebook guide, let alone the notion of 'the most distributed one in the country', since the material is specifically from Paraná). Another necessary adaptation is related to the content: as it is not a textbook, the Notebook does not bring sections of assignments and panels. According to Amaral et al. (2022, p. 187), the panels correspond to "the sections of the textbook in which the author approaches a content, brings their ideas about the studied concept, the

context those ideas can be applied in and examples". Therefore, the Notebook was analysed as a set of contents presented by the authors who articulate Rural Education, its social/traditional practices and Mathematics.

The decision of using the Teorema System in the present research still results from the familiarity of the second author with the methodology, since she is a partner researcher of the authors who elaborated the methodological approach and have been applying it in their investigations about didactic materials, such as textbooks (Alves; Amaral & Litoldo, 2025) and works from Life Project (Andrade & Litoldo, 2025). The Teorema System is structured in three stages: Planning, Material Exploration and Data Treatment (Figure 3).

Figure 3

Adapted synthesis of Teorema System (Elaborated from Amaral et al., 2022)



In Stage 1 – Planning, the Notebook was considered material to be analysed, defining the specific excerpt of the study (Figure 1 and Figure 2). Although the Notebook does not contemplate Mathematics concepts or knowledge areas the same way textbooks do, it is also configured as a knowledge production environment, since it presents, though indirectly, learning objectives, knowledge objects and mathematical contents.

In Stage 2 – Material Exploration, a careful reading of the Notebook was done, in order to understand its structure and, after that, to identify the excerpts related to the investigation problems, i. e., the particular research aspects. That identification process was systematized through notes that became the research data.

Finally, in Stage 3 – Data Treatment, the analysis was carried out in the light of the theoretical framework in order to build a singular analysis of the proposed content in the Notebook, recognizing it as a "knowledge production environment, which is historically developed, socially and culturally elaborated, produced for certain purposes and used with particular intents" (Amaral et al., 2022, p. 199). Next, the data analysis and discussion will be presented.

RESULTS AND DISCUSSION

This section will analyse the Notebook, focusing the Financial Education propositions and the Integration between Mathematics and Natural Sciences presented in it. The first subsection, 'Contradictions in the Financial Education approach: policies, curricula and distancing related to Rural Education', discusses the alignment of the Financial Education guidelines to an individualizing and marketing logic, emphasizing the distance from rural people's realities. The second one, 'Among contradictions, tensions and potentialities: Mathematics in the territorial dispute and resistance', examines Mathematics and Robotics 1 and Agricultural and Livestock facilities units, highlighting methodological progress and ideological contradictions that tension the role of Mathematics in the education of rural students.

Contradictions in Financial Education approach: policies, curricula and distancing related to Rural Education

Financial Education (EF) was officially included in the curriculum from its insertion in the National Common Curricular Base, in 2018. However, discussions on Financial Education in Brazil, in general, started from 2010, with the creation of Financial Education National Strategy (Enef) through Decree No. 7.397/2010 (Brasil, 2010b), later replaced by Decree 10.393/2020 (Brasil, 2020). The creation of Financial Education National Strategy was strongly influenced by OECD, which, in a global movement, guides member nations and partners to establish Financial Education strategies.

Financial Education National Strategy, based on OECD guidelines, defines Financial Education as "the process of improving individuals' and society's understanding about financial concepts and products through clear information, education and guidance, in order that they can make more conscious and responsible decisions regarding their finances" (Brasil, 2010a, p. 3). It is observed that this definition is related to a market nature Financial Education, highlighting financial products and making individuals responsible for their economic situation. A recurring criticism is that OECD and Enef emphasize an individualized approach, as if financial success or failure

depended only on the individual, without considering social, economic and political aspects more widely.

In opposition to that, a Financial Education conception, based on Mazzi, Hartmann and Pessoa (2024), is defended, focusing the collective and solidary development, supported by ethical and environmental principles, committed to dignity of historically marginalized groups. To the authors, it is not just about discussing inequality, but facing it, questioning the bad income distribution and reflecting over the role of minimum wage to guarantee dignified life conditions. Therefore, being financially educated means to understand how capitalism and neoliberalism can impact social, environmental, political, ethical, esthetical and cultural human dimensions, by proposing resistance strategies and transformation toward social justice.

When analysing the Organizational Framework of the three years of High School, it is observed that, in general, the learning objectives, the knowledge objects and the contents do not properly articulate with the proposed abilities. By taking the 1st year as an example, if we consider the scientific investigation axis ability and the creative processes axis ability, we can see that the learning objectives, the knowledge objects and the contents are mostly instrumental, focusing personal and individual Financial Education, dealing with investments, planning, purchases, revenue and expense and income sources. In another direction, the ability related to scientific investigation axis is wide and approaches ethical, esthetical questions, freedom, democracy, plurality, social justice, solidarity and sustainability; in turn, the ability related to creative processes axis refers to new ideas, new propositions, different languages, media and platforms, which are not explored in the learning objectives.

By taking another example, also related to the 1st year, but involving the ability of creative processes axis and the ability of sociocultural mediation and intervention axis, it is observed that such abilities are innovative and wide, approaching sociocultural, environmental questions, co-responsibility and common welfare (ability of sociocultural mediation and intervention axis), as well as creative, original or innovative solutions (ability of creative processes axis). However, the learning objectives, the knowledge objects and the contents are markedly marketing related and aligned with a capitalistic logic. Those elements are important and necessary, specially for High School students, but they do not dialogue with the proposed abilities, becoming disconnected dimensions.

When analysing the Notebook Financial Education unit as a whole, it is observed, in general, that there is a lack of stronger and more explicit relations to Rural Education; there is, predominantly, a superficial tangency, without depth. It is understood that Rural Education and Financial Education come close to themes such as country people's rights, the labour value, the dicotomy between family agriculture and agricultural business, the right to what is produced, the land value and the focus on the environmental presevation and regeneration, for instance.

Andrade and Selva (2024) highlight the role of school in the development of a Financial Education that is grounded on what country students think, seek and must know to act in their communities and in the society they live, looking at the country as a place to live. That look must overcome the simple territorial living, recognizing the country as home that can guarantee life quality and favour a critical and socially referenced education, so that the individuals may understand their rights and fight for them, for instance, for the establishment of public policies that can help the small farmer. Therefore, it is considered that the relations between Financial Education and Rural Education could be strengthened in the Notebook.

One of the few identified examples about that articulation is in the 1st year, in the ability of creative processes axis and the ability of entrepreneurship axis, where the 'rural financing'content is developed.

In the 2nd year, in the abilities of scientific investigation axis and the sociocultural mediation and intervention axis, a limited correspondence is observed between the second ability and the first knowledge object, which deals with conscious consumption. Although conscious consumption might, somehow, contribute to preserve the environment, it is not enough, since degradation is related to capitalistic production structures, to excess profits and to the logic of the surplus. The learning objectives, the knowledge objects and the contents are necessary and important, specially for High School students, but they require complementations that will allow a social, political, environmental pedagogical work, ethically committed to the critical Financial Education.

The entrepreneurship has a relation with Financial Education and it is presented in the Notebook as a curricular unit in Formative Itineraries as an axis and composing learning objectives and knowledge objects. However, it cannot be denied that entrepreneurship requires support from public management in order that the entrepreneur will be able to face the bureaucratic and financial obstacles. It agrees with Costa and Rodrigues (2022), when they

state that it is necessary not to lose sight that the romanticized entrepreneurship makes work worse, denying fundamental rights to the workers, such as vacations, FGTS[5], medical insurance, public social security, leaving small entrepreneurs on their own and even making them believe that this is the best choice, reproducing and legitimating the capital logic.

Among contradictions, tensions and potentialities: Mathematics in the territorial dispute and resistance

From the analysis of the four curricular units, it was possible to observe that not all of them have knowledge objects and contents connected to Mathematics, as in the case of curricular units of Biotechnology in Agriculture and Livestock and Applied Energies in Agriculture and Livestock. That confirms that, although the proposition is to integrate Mathematics to Natural Sciences, in these two curricular units that does not happen. On the other hand, in Mathematics and Robotics I and Agricultural and Livestock facilities, it is observed the presence of varied knowledge objectives, contemplating Measures, Probability and Statistics, Financial Mathematics, Geometry, Functions, Linear Systems and Trigonometry.

Those objectives cover a great deal of mathematical contents. In the Financial Mathematics context, for instance, themes such as full capacity rate adjustment, profit, loss and cost calculations are explored, as well as the nalysis of ration production regarding its costs. In Plane Geometry, geometric figures, calculation of areas and polygons are worked on, as well as the determination of area and perimeter for cultivation of regional produce and the amount of necessary material for building fences and pickets for livestock farming. In addition, those two curricular units even contemplate the study of percentage, rule of three, volume, affine and quadratic functions, graphics and matrices, among other mathematical contents.

From this outlook, a more detailed analysis will be carried out about the presented work propositions connected to those knowledge objects and mathematical contents. Each unit is divided in three theme sections and there are learning objectives in each of them.

Regarding the second theme unit, Mathematics and Robotics I, it is observed that in the very introduction, the Notebook is concerned to delineate the context where the unit is placed. According to the document, “this Curricular Unit is presented in the **rural context** through problem solving

[5] Employee’s Severance Guarantee Fund.

related to rural activities and development, where Mathematics and Robotics become driving force" (Paraná, 2023, p.121, our emphasis). When explaining about the unit objective, it was observed that it dialogues with the Critical Mathematics Education when it points out that students have to "identify the application, learn and use mathematical calculations for solving problem situations related to agricultural and livestock activities, developing abilities and competences to better plan actions, make choices and make decisions in that context" (Paraná, 2023, p.121).

Figure 4

Theme sections and their learning objectives (Elaborated by the authors from Paraná, 2023, our emphasis)

Theme sections structured in the curricular unit	Learning Objectives
Section 1: Mathematics, agriculture and technologies for rural work	1.1 "Identifying and representing everyday situations through linear systems, using them to associate planting and fertilization calculation" (Paraná 2023, 125). 1.2 "Understanding, using and analysing concepts and calculation procedures of probability and statistics in the analysis and evaluation of possibilities, in order to make decisions, predicting some event may occur, favouring or frustrating the agricultural production (Paraná 2023, 125-126). 1.3 "Classifying the polygon side variations, representing them graphically by using dynamic geometry software to apply calculations of plantation areas (Paraná 2023, 126). 1.4 "Understanding what Robotics is, its applications and importance in several contexts, specially in the country, to evaluate the benefits and possible disadvantages of its use, both for scale agriculture and for family and subsistence agriculture, producing arguments, favourable or not, to implement robotic resources in those contexts" (Paraná 2023, 126).
Section 2: Mathematics, Livestock and Robotics contributions	2.1 "Investigating and relating Mathematics in field and agricultural and livestock context activities, in order to propose solutions and improvements for local community" (Paraná 2023, 127). 2.2 "Listing and classifying the kinds of animal breeding, in the agricultural and livestock and field context, in order to identify situations in which it will be necessary to make choices, associating Mathematics to decision making for personal or collective investments in the country cultivation" (Paraná 2023, 127-128).

	2.3 “Solving, elaborating and applying mathematical problems related to picket rotation according to the kind of animal breeding, food, ration production, grazing methods and handling, full capacity rate matrix, aiming at higher productivity and profitability, preventing from the process of degradation of local and regional pastures” (Paraná 2023, 128). 2.4 “Understanding what they are and what are the features of actuators, sensors and Arduino, to design new robotic applications, original or not, in the agricultural and livestock context, through investigation of problems and necessities of local/regional reality” (Paraná 2023, 128).
Section 3: Agriculture and livestock of the future: robotics in the country	3.1 “Getting to know and apply in a creative way sensors and actuators, proposing projects regarding agriculture and livestock, selecting and intentionally mobilizing knowledge of Robotics and Mathematics for solving problems presented in real situations” (Paraná 2023, 129).

When analysing the considered learning objectives (Figure 4), it is observed a proposition that intends to allow some possible relations to be established among Mathematics, agriculture, livestock and technologies for rural work. However, it is possible to notice that the rural context appears, but, at the same time, there is a demarcation and a counterpoint. For instance, in the 1.1, 1.2 and 1.3 objectives, the rural context is contemplated. However, in the 2.1 and 2.1 learning objectives, there is a context demarcation when ‘of agricultural and livestock and country context’ is mentioned. Here the Notebook intent is questioned when it demarcates the agricultural and livestock context, considering that in rural context, agriculture and livestock are existing practices.

It is questioned if that ponderation does not mean a demarcation between agricultural business and rural contexts, since it was also possible to notice that in some learning objectives there are ideas connected to agricultural business ideologies. These cases appear in 1.4 objective, when scale agriculture is mentioned, and in 2.3, when higher productivity and profitability are mentioned. Another characteristic that is not aligned to rural principles either, but it is present in 2.3 objective, is about the “process of degradation of local and regional pastures” (Paraná 2023, 128).

That degradation is aligned with monocultures and use of pesticides, which are characteristics of agricultural business, because “the education in large rural properties [...] metaphorically represent the capitalistic productive system, to which school and country people are submitted” (Sachs & Ferraiol,

2021, p. 994-995). At last, the Notebook intent is questioned when it proposes theme section 3, entitled 'The agriculture and livestock of the future: the robotics in the country', where it just focuses on agricultural and livestock projects, without pondering that family agriculture, the sustainable livestock and agriculture system (PAS) and the formation of agroforestry are already today's options for an agriculture and livestovk of the future'.

Those learning objectives are within contexts that are proposed as starting points for Mathematics contextualized practices. However, according to Costa (2023, p.17), that methodology "strongly increases capitalistic agriculture through agriculture business, large scale production, monoculture, environmental degradation, production of commodities, large rural properties", and it does not discuss the "aticulated understanding of Rural Education, agroecology and food security as a fight strategy facing the advancement of neoliberal policies" (Costa, 2023, p.17), i.e., those methods may be "understood in a metaphorical and literal way [...], result of politics of a bourgeois state that acts to keep domain of classes (Sachs & Ferraiol, 2021, p.1005). Beyond that, it is possible to infer that, actually, the proposition aims at robotics work in the country, for small farmers, or, if the country is in a deceptive condition, the main focus is really the development of a robotics devoted to agricultural business.

So, in this theme unit, the dialogue of Mathematics to rural school reality is presented as a promising proposition, but still unclear, bringing in the Notebook many methodological ways that can be adopted to "lead students to notice the presence of Mathematics in their everyday activities, giving meaning to their concepts, having in mind that the daily used mathematical knowledge is surrounded by social relations" (Paraná, 2023, p. 122). But, even the Notebook bringing several ideas about how to approximate Mathematics and Robotics to Rural Education, those ones converge to an acceptance of reality and mathematical applications, and diverge from showing a methodology focusing on a critical questioning, because, "in order that education, practice and research may be critical, it must discuss basic conditions for obtaining knowledge, must be aware of social problems, inequalities, suppression and so on, and must try to make education a progressively active social force" (Skovsmose, 2001, p. 101).

The other analysed curricular unit was Agriculture and Livestock Facilities, which, as shown in its introduction, aims to

> [...] present the mathematics used in agricultural and livestock facilities to students, may times already performed by them,

> relating mathematical knowledge to their own knowledge, promoting a more meaningful learning, respecting their cultural roots, carried from their families, friends or community, considering their previous knowledge and their cultural history (Paraná, 2023, p. 147).

Therefore, this unit emphasizes the valorization of rural people's culture, fight, history and social/traditional practices. The methodological propositions presented by the Notebook show that the starting point must be the knowledge students bring from their daily activities and, to this end, the document suggests that

> [...] problem situations should be focused on constructions that are found in rural properties, built through country people's empirical knowledge. Research activities should make a survey of those constructions in the community the school is inserted; the possible problems that can be presented; the mathematical reasoning used in their construction; the concepts of Ethnomathematics and mathematical modelling being important for the development of a meaningful learning (Paraná, 2023, p. 154).

It is emphasized that Ethnomathematics is strongly suggested in the Notebook, as a way to methodological actions, since it presents several texts focusing on the insertion of culture and identity in Mathematics classes, as well as proposing projects that dialogue with their roots. Other possibilities are also mentioned, such as working with inverted classroom, elaborating projects and models, so that students will be the protagonists of their learning.

The work from Critical Mathematics Education may be identified from learning objectives (Figure 5), when criticality and reflection are mentioned in several objectives. For instance, in 1.2 objective, the use of mathematical knowledge is mentioned for the development of agricultural and livestock facilities in a critical and reflexive way regarding the best conditions. In 1.3 objective, the assertive and creative elaboration of projects is observed, as well as in 1.4 objective, when it stresses the diversity of materials used in agricultural and livestock facilities.

Figure 5

Theme sections and their learning objectives (Elaborated by the authors from Paraná, 2023, our emphasis).

Theme sections structured in the curricular unit	**Learning Objectives**
Section 1: General aspects for implementing rural facilities	1.1 "Understanding the aspects related to basic conditions for agricultural and livestock facilities by using mathematical knowledge to analyse and solve local problem situations" (Paraná 2023, 150). 1.2 "Getting to know the stages for planning agricultural and livestock facilities by usnig mathematical knowledge to **develop them with criticality, reflecting about the best conditions** for implanting them, proposing interventions in the existing facilities when necessary" (Paraná 2023, 151). 1.3 "Understanding the component parts of the projects for agricultural and livestock facilities, for an **assertive and creative elaboration of projects for rural facilities** to meet the local/regional needs" (Paraná 2023, 151). 1.4 "Identifying the diversity of materials used in agricultural and livestock facilities, **critically analysing their** characteristics for better use in the projects of those facilities" (Paraná 2023, 151).
Section 2: Construction techniques for agricultural and livestock facilities	2.1 "Getting to know the various construction techniques of agricultural and livestock facilities, understanding their componentes, to make **a critical analysis** of their use in creative projects and interventions to meet the local /regional needs" (Paraná 2023, 152).
Section 3: Kinds of agricultural and livestock constructions/facilities	3.1 "Getting to know the kinds of agricultural and livestock facilities for the development of projects of agricultural and livestock facilities by using mathematical processes and knowledge to **formulate concrete, creative propositions, articulated** with personal/collective local/regional projects, aiming to build facilities **to increase the property productivity and profitability**" (Paraná 2023, 153).

A remarkable aspect of this curricular unit is that, contrary to the former unit, it does not differ the agricultural and livestock context from the rural context. However, in its narrative, the expressions 'rural facilities' and 'agricultural and livestock facilities' are used, but the understanding of each one is unclear. Besides, as in the former unit, it is possible to identify elements that refer to agricultural business. This is observed, for example, in 3.1 objective, in which the increase of productivity and profitability of the property is mentioned.

Based on the presented results and searching for studies that explore the dialogue between the formative itineraries of Rural Education and Mathematics Education, a gap in the literature was observed, which opens space for discussions and reflections about that theme. That lack of researches shows a substantial challenge for building pedagogical practices grounded in the Rural Education specificities. Although documents, such as the Formative Itinerary Notebook of Paraná, propose the integration between Mathematics and the social/traditional practices, there are few investigations that systematically approach that interaction. The shortage of empirical studies restricts the understanding of potentialitites of approaches, such as the Critical Mathematics Education and the Ethnomathematics in rural context, jeopardizing the development of curricula that promote an emancipatory and contextualized education regarding the rural people's reality.

FINAL CONSIDERATIONS: BETWEEN THE CRITICAL PROPOSITION AND THE NEOLIBERAL ENTANGLEMENTS

When trying to understand the proposed dialogues in the formative itineraries of Rural Education between social/traditional practices and Mathematics, in Paraná state, the present analysis allowed to show tensions between the Rural Education principles and the formative intents expressed in official materials. Out of the four curricular units intended to integrate Mathematics and Natural Sciences, only two – Mathematics and Robotics I and Agricultural and Livestock Facilities – present knowledge objects and contents directly related to Mathematics.

It was observed that the mathematical knowledge objects presented in the Notebook dialogue with some mathematical contents, such as Measures, Probability and Statistics, Financial Mathematics, Geometry, Functions, Linear Equation Systems and Trigonometry. For instance, in Geometry, the contents permeate the contextualization of the growth dynamics of fodder plants that are used in animal feeding, articulated to climatic variables, areas and perimeters

of regional cultivation. In case of Financial Mathematics, the focused words are profit, loss and costs, as it occurs in ration production and market evaluations.

It is then observed that such units present potential dialogues between Mathematics Education and the rural knowledge, favouring articulations between students' experiences and school knowledge. However, the proposed approaches remain predominantly descriptive and operational, reinforcing the adaptation to a reality that is already established, without encouraging the critical questioning about social and economic structures that entangle the country daily routine.

Although the material provides interlocutions with perspectives such as Critical Mathematics Education, permeated, for instance, by Ethnomathematics, they are peripheral and do not structure the predominant formative logic, grounded in a technical and functional conception of Mathematics. The learning objectives, although pertinent, reveal conceptual and ideological ambivalences, specially when they incorporate terms such as 'productivity' and 'profitability'. When they are not problematized, such categories tend to reproduce the agricultural business values, contradicting the Rural Education political and pedagogical foundations.

In the analysis of Financial Education curricular unit, a fragile articulation between the proposed contents and the rural people's reality was identified. Such discordance is shown in the contrast between extensive abilities – focused on social, ethical and environmental dimensions – and contents that are centered in market competences connected to the neoliberal logic. The absence of criticality in dealing with economic themes, in addition to the little consideration of sociocultural practices of rural people, show some distancing from emancipatory education principles.

If there were an effective articulation between abilities and contents, it would be possible to critically explore the contradictions of financial system, promoting debates about ethics, social justice, democracy, solidarity, food sovereignty and sustainability – fundamental dimensions for Rural Education.

Considering that scenario, it is emphasized that the Notebook may be a relevant tool, as long as it is mobilized by the critical eye of teachers, students, managers and elaborators of public policies. It is necessary those individuals to be focused on the proposition contradictions and be decided to tension them, in order to redirect pedagogical practices, based on the principles of a socially referential education, committed to social justice, rural people's dignity and transformation of reality.

AUTHORS' CONTRIBUTIONS STATEMENTS

B. F. L. e C. P. were responsible for the production and organization of data that substantiated the presented analysis in this article. C.P. contributed with the theoretical foundation and data analysis related to Financial Education, while L.B., C.P. and B.F.L. performed the analysis of the other produced data. The writing of the present article was collectively done by the authors.

DATA AVAILABILITY STATEMENT

The data that substantiate the results of this investigation have *The Formative Itinerary Notebook – Rural Education* as their source, which was elaborated by State Department of Education of Paraná. The referred material can be accessed by the following link: https://acervodigital.educacao.pr.gov.br/pages/search.php?search=%21collection3701&k=0e26b39e7d. Accessed on: April 15, 2025.

REFERENCES

Alentejano, R. R.; Egger, D. da S. (2021). Agronegócio. In: A. P. Dias et al. (org.). Dicionário de agroecologia e educação. (pp. 97-104). São Paulo: Expressão Popular; Rio de Janeiro: Escola Politécnica de Saúde Joaquim Venâncio.

Alves, V. M. S., & Carvalho, M. E. R. D. (2022). A formação de professores na Base Nacional Comum (BNC-Formação): impasses para execução dos itinerários formativos. (pp. 80 – 110). In: C. M. N. de Carvalho; I. B. Soares; M. L. R. Costa (Org.). Veredas e (re) configurações da formAção docente. Editora Veredas.

Alves, G. A., Amaral, R. B., & Litoldo, B. F. (2025). Entre o conteúdo e o contexto: A distribuição das tarefas de geometria nos livros didáticos do Novo Ensino Médio. *Revista de Educação Matemática, 24*, 1–23.

Amaral, R. B., Mazzi, L. C., Andrade, L. V., & Perovano, A. P. (2022). Livro Didático de Matemática: Compreensões e reflexões no âmbito da Educação Matemática. Mercado de letras.

Andrade, L. V., & Litoldo, B. F. (2025). Projeto de Vida e Educação do Campo: Intencionalidades político-pedagógicas em um livro didático do PNLD

2021. In *Anais do I Encontro teorEMa - Interlocuções entre Geometria e Matemática* (no prelo).

Andrade. D. M; Selva, A. C. V. (2024). Diálogo entre Educação Financeira e Educação do Campo: o que dizem os foregrounds e backgrounds de jovens e adultos do Campo? In: Kistemann Junior, M. A. Giordano, C. C. (org.) Educação Financeira: olhares, incertezas e possibilidades. 1. ed. v. 4. (pp. 43-56). São Paulo: Akademy.

Brasil. (2023). Lei nº 10.639, de 9 de janeiro de 2003. Altera a Lei no 9.394, de 20 de dezembro de 1996. Brasília, DF.

Brasil. (2010a). Banco Central do Brasil: Implementando a Estratégia Nacional de Educação Financeira. Brasília, DF.

Brasil. (2010b). Decreto nº 7.397, de 22 de dezembro de 2010. Institui a Estratégia Nacional de Educação Financeira - ENEF, dispõe sobre a sua gestão e dá outras providências. Brasília, DF.

Brasil. (2011). Parecer CNE/CEB nº 5, de 5 de maio de 2011. Diretrizes Curriculares Nacionais para o Ensino Médio. Brasília, DF.

Brasil. (2012). Resolução CNE/CEB nº 6, de 20 de setembro de 2012. Diretrizes Curriculares Nacionais para a Educação Profissional Técnica de Nível Médio. Brasília, DF.

Brasil. (2016). Emenda Constitucional Nº 95, de 15 de dezembro de 2016. Altera o Ato das Disposições Constitucionais Transitórias, para instituir o Novo Regime Fiscal, e dá outras providências (n. 241, p. 2-3). Diário Oficial da União: seção 1, Brasília, DF.

Brasil. (2017). Lei n. 13.415 de 16 de fevereiro de 2017. Altera as Leis nº 9.394, de 20 de dezembro de 1996, que estabelece as diretrizes e institui a Política de Fomento à Implementação de Escolas de Ensino Médio em Tempo Integral. Brasília, DF.

Brasil. (2018). Base Nacional Comum Curricular. Brasília, DF.

Brasil. (2020). Decreto n.º 10.393, de 9 de junho de 2020. Institui a nova Estratégia Nacional de Educação Financeira - ENEF e o Fórum Brasileiro de Educação Financeira - FBEF. Brasília, DF.

Caldart, R. S. (2021). Educação do campo e agroecologia. In: A. P. Dias et al. (org.). Dicionário de agroecologia e educação. São Paulo: Expressão Popular; Rio de Janeiro: Escola Politécnica de Saúde Joaquim Venâncio.

Caldart, R. S.; Pereira, I. B.; Alentejano, P. & e Frigotto, G. (2012). Dicionário da Educação do Campo. São Paulo: Expressão Popular; Rio de Janeiro: Escola Politécnica de Saúde Joaquim Venâncio.

Costa, R. C da. (2023). A implementação da Reforma do Ensino Médio no Estado do Paraná: o avanço das políticas neoliberais e os ataques à Educação do Campo. Revista de Estudios Teóricos y Epistemológicos en Política Educativa, 8, 1-23.

Costa, M. F. & Rodrigues, D.A. (2022). Empreendedorismo como estratégia do aumento da precarização e desorganização do proletariado. Dossiê temático: Os movimentos de precarização do trabalho e a educação. Revista Tópicos Educacionais, v. 28, n. 01, p. 125-150, Recife.

D'Ambrósio, U. (2002). Etnomatemática: Elo entre as tradições e a modernidade. (Coleção Tendências em Educação Matemática, 2a Edição). Belo Horizonte: Autêntica.

Ferretti, C.J. (2016). Reformulações do Ensino Médio. Holos, ano 32 (6), 71-91.

Gil, A. C. (2002). Como elaborar projetos de pesquisa. (4º). Atlas.

Godoy, A. S. (1995). Introdução à pesquisa qualitativa e suas possibilidades. Revista de Administração de Empresas, 35(2), 57 - 63.

Goldenberg, M. (2011). A arte de pesquisar: Como fazer pesquisa qualitativa em Ciências Sociais (12ª ed). Record.

Mazzi, L. C.; Hartmann, A. L. & Pessoa, C. A. S. (2024). Educação Financeira e Justiça Social: reflexões no âmbito da Educação Matemática. Bolema, Rio Claro, SP, v. 38, e240044.

Mendonça, S. & Fialho, W. C. G. (2020). Reforma do Ensino Médio: velhos problemas e novas alterações. Revista de Educação PUC-Campinas, 25, e204626. Epub 17 de junho de 2020.

Oliveira, S. M. de. (2024). A Educação Matemática Crítica em uma turma do "Novo" Ensino Médio. Revista de Investigação e Divulgação em Educação Matemática, 8(1).

Oliveira, M. W.; Gonçalves e Silva, P. B.; Gonçalves Junior, L.; Garcia-Montrone, A. V. & Joly, I. Z. (2014). Processos educativos em práticas sociais: reflexões teóricas e metodológicas sobre pesquisa educacional em espaços sociais. In: Oliveira, M. W.; Sousa, F. R. (Org.). Processos educativos em práticas sociais: pesquisas em educação. (p. 29 – 46). São Carlos: EDUFSCar.

Paraná. (2006). Diretrizes Curriculares de Educação do Campo. Secretaria de Estado da Educação – Superintendência da Educação: Curitiba, SEED.

Paraná. (2023). Caderno de Itinerário Formativo: Ementa das unidades curriculares ofertadas – Educação do Campo. Secretaria do Estado da Educação.

Sachs, L. & Ferraiol, T. F. (2021). Educação entre latifúndios: algumas contradições. ReDiPE: Revista Diálogos e Perspectivas em Educação, [S. l.], v. 4, n. 2, p. 140–153, 2022. Disponível em: https://periodicos.unifesspa.edu.br/index.php/ReDiPE/article/view/1902. Acesso em: 11 ago. 2025.

Securato, J. R. Educação financeira: uma proposta para o ensino fundamental e médio. (2002). São Paulo: Saraiva.

Silva, M. R. D. (2018). A BNCC da reforma do ensino médio: o resgate de um empoeirado discurso. Educação em revista, 34, e214130.

Silveira, R. de C. (2009). Neoliberalismo: conceito e influências no Brasil – de Sarney a FHC [Dissertação de Mestrado]. Programa de Pós-graduação em Ciência Política. Universidade Federal do Rio Grande do Sul.

Skovsmose, O. (2001). Educação Matemática Crítica: a questão da democracia. Tradução A. Lins; J. L. Araújo. Campinas: Papirus.

Teixeira, R. de F. B.; Leão, G. M. C. Domingues, H. P. & Rolin, E. C. (2019). Concepções de itinerários formativos a partir da resolução CNE/CEB Nº 06/2012 e da lei nº 13.415/2017. (v. 28, p. 59 – 66). In: D. F. Andrade (Org.). Educação no Século XXI. 1ed. Belo Horizonte - MG: Poisson.

Ubes. (2016). União Brasileira dos Estudantes Secundaristas. UBES divulga a lista das escolas ocupadas e pauta das mobilizações (11 out.). Ubes.