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Integrating financial education into the elementary school curriculum: an analysis of public policies and pedagogical strategies

Integrando la educación financiera escolar en el currículo de la enseñanza primaria: un análisis de políticas públicas y estrategias pedagógicas

Intégrant l'éducation financière scolaire dans le curriculum de l'enseignement primaire : une analyse des politiques publiques et des stratégies pédagogiques

Integrando a educação financeira escolar no currículo do ensino fundamental: uma análise das políticas públicas e estratégias pedagógicas

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Abstract

This article highlights the relevance of School Financial Education (SFE) as a component of the Elementary School curriculum, demonstrating its importance for the formation of competent individuals in managing their financial resources. Through the analysis of current public policies, particularly the National Common Curricular Base (BNCC), the text explores the integration of personal finance concepts into the school curriculum and discusses pedagogical strategies for its implementation. The article is qualitative in nature and illustrates the applicability of SFE in practice, describing the development and execution of SFE pedagogical activities adapted to students in the early years (4th and 5th grades) of Elementary School. These activities demonstrate the possibility of introducing SFE effectively and meaningfully from the early years of education. Based on the responses obtained, it is inferred that students still have difficulties in formulating numerical expressions and interpreting problems, indicating areas that may need reinforcement or different pedagogical approaches. The results of these activities and their contribution to students' understanding of financial management are also discussed, highlighting the effectiveness of SFE as a teaching tool.

Keywords: School financial education, Common national curriculum, Elementary

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education, Pedagogical strategies.

Resumen

Este artículo destaca la relevancia de la Educación Financiera Escolar (EFE) como componente del currículo de Educación Primaria (EP), subrayando su importancia para la formación de individuos competentes en la gestión de sus recursos financieros. A través del análisis de las políticas públicas actuales, en particular la Base Nacional Común Curricular (BNCC), el texto explora la integración de los conceptos de finanzas personales en el currículo escolar y discute estrategias pedagógicas para su implementación. El artículo es de carácter cualitativo e ilustra la aplicabilidad de la EFE en la práctica, describiendo la elaboración y ejecución de actividades pedagógicas de EFE adaptadas a los estudiantes de los primeros años (4º y 5º grados) de Educación Primaria. Estas actividades evidencian la posibilidad de introducir la EFE de manera efectiva y significativa desde los primeros años de educación. A partir de las respuestas obtenidas, se infiere que los estudiantes todavía tienen dificultades para formular expresiones numéricas e interpretar los problemas, indicando áreas que pueden necesitar refuerzo o enfoques pedagógicos diferentes. Los resultados de estas actividades y su contribución a la comprensión de los estudiantes sobre la gestión financiera también se discuten, destacando la eficacia de la EFE como una herramienta de enseñanza.

Palabras clave: Educación financiera escolar, Currículo nacional común, Educación primaria, Estrategias pedagógicas.

Résumé

Cet article met en évidence la pertinence de l'Éducation Financière Scolaire (EFS) comme composant du programme de l'Enseignement Élémentaire (EE), soulignant son importance dans la formation d'individus compétents dans la gestion de leurs ressources financières. À travers l'analyse des politiques publiques actuelles, en particulier la Base Nationale Commune Curriculaire (BNCC), le texte explore l'intégration des concepts de finances personnelles dans le programme scolaire et discute des stratégies pédagogiques pour sa mise en œuvre. L'article est de nature qualitative et illustre l'applicabilité de l'EFS en pratique, décrivant la conception et l'exécution d'activités pédagogiques d'EFS adaptées aux élèves des premières années (4ème et 5ème grades) de l'Enseignement Élémentaire. Ces activités montrent la possibilité d'introduire l'EFS de manière efficace et significative dès les premières années d'éducation. Sur la base des réponses obtenues, il est déduit que les élèves éprouvent encore des difficultés à formuler des expressions numériques et à interpréter les problèmes, indiquant des domaines qui

pourraient nécessiter un renforcement ou des approches pédagogiques différentes. Les résultats de ces activités et leur contribution à la compréhension des élèves sur la gestion financière sont également discutés, soulignant l'efficacité de l'EFS comme outil d'enseignement.

Mots-clés : Éducation financière scolaire, Base nationale curriculaire commune, Éducation élémentaire, Stratégies pédagogiques.

Resumo

Este artigo destaca a relevância da Educação Financeira Escolar (EFE) como componente do currículo do Ensino Fundamental (EF), evidenciando sua importância para a formação de indivíduos competentes na gestão de seus recursos financeiros. Por meio da análise das políticas públicas atuais, em particular a Base Nacional Comum Curricular (BNCC), o texto explora a integração dos conceitos de finanças pessoais no currículo escolar e discute estratégias pedagógicas para sua implementação. O artigo é de cunho qualitativo e ilustra a aplicabilidade da EFE na prática, descrevendo a elaboração e execução de atividades pedagógicas da EFE adaptadas aos alunos dos anos iniciais (4º e 5º anos) do Ensino Fundamental. Estas atividades evidenciam a possibilidade de introduzir a EFE de maneira eficaz e significativa desde os primeiros anos da escola. A partir das respostas obtidas, infere-se que os alunos ainda apresentam dificuldades em formular expressões numéricas e interpretar os problemas, indicando áreas que podem precisar de reforço ou de abordagens pedagógicas diferentes. Os resultados dessas atividades e suas contribuições para o entendimento dos estudantes sobre gestão financeira são também discutidos, destacando a eficácia da EFE como uma ferramenta de ensino.

Palavras-chave: Educação Financeira Escolar, Base nacional curricular comum, Ensino Fundamental, Estratégias Pedagógicas.

Integrating school financial education into the elementary school curriculum: an analysis of public policies and pedagogical strategies

The formation of financially conscious and responsible citizens has become a growing concern in the field of education, especially considering the complexity of the current global economic landscape. School Financial Education (SFE[3]) emerges in this context as an essential component in the educational curriculum, significantly contributing to preparing young people for the financial challenges of adult life.

SFE not only provides knowledge related to financial resource management but also promotes the development of individual, familial, and social awareness regarding responsible money use and management. Furthermore, the analysis of public policies such as the National Common Curricular Base - BNCC (Brazil, 2017) is crucial for understanding the structures and guidelines that enable the integration of SFE into the school curriculum.

Financial Education is one of the highlighted areas in the Contemporary Transversal Themes - TCT (Brazil, 2019), which are arranged into six thematic macro areas and are coordinated by the General Coordination of Environmental Education and Transversal Themes of Basic Education, within the Ministry of Education: Environment, Health, Economy, Citizenship and Civics, Multiculturalism, and Science and Technology. Among the TCTs listed in the BNCC, the Economy theme includes Financial Education as one of the suggested topics. In this document, there are proposals that can be addressed either in one or more components in an intradisciplinary, interdisciplinary, or transdisciplinary manner, but always cutting across knowledge areas.

The objective of this article is to explore SFE in the context of Elementary Education, focusing on the analysis of relevant public policies. It is worth noting that a component of this research is to recognize specific aspects of external assessments that can be addressed in the classroom, considering their effectiveness and the obstacles faced when applied to elementary school students.

Throughout this study, the idea of SFE is reinforced not only as a discipline but as an important tool in the development of financially competent and conscious citizens. In doing so, the aim is to enrich the debate on the best approaches and strategies to effectively incorporate SFE into Elementary Education, particularly in mathematics classes.

[3] In this text, Financial Education will be addressed as School Financial Education (SFE) to emphasize that it pertains to Financial Education for Elementary School students.

Financial Education in the Early Years of Elementary School

When reflecting on Financial Education (FE) for Elementary Education (EE), it's important to pay attention to developing differentiated activities for the early years and later years, with a different didactic approach for each level of education. In the early years of EE, it's relevant to value playful learning situations, stimulating the student to develop new ways of relating to the world, new possibilities of reading and interpreting phenomena (Brazil, 2017). The BNCC document (Brazil, 2017, p. 58) emphasizes that: "At this stage of life, children are experiencing important changes in their development process that have repercussions on their relationships with themselves, with others, and with the world."

The Organization for Economic Cooperation and Development - OECD (2005) already stated that Financial Education should be part of the school curriculum since the early years as a way to work on basic ideas through the discussion of current and historical themes involving money and its relationship, starting from the construction of an individual, familial, and social awareness, not replacing the role of consumer protection agencies or financial institution regulatory systems but complementing ideas in general.

1st grade	(EF01MA19) Recognize and relate values of coins and bills of the Brazilian monetary system to solve simple situations of the student's daily life.
2nd grade	(EF02MA20) Establish the equivalence of values between coins and bills of the Brazilian monetary system to solve everyday situations.
3rd grade	(EF03MA24) Solve and elaborate problems involving the comparison and equivalence of monetary values of the Brazilian system in buying, selling, and exchanging situations.
4th grade	(EF04MA25) Solve and elaborate problems involving buying and selling situations and forms of payment, using terms such as change and discount, emphasizing ethical, conscious, and responsible consumption.
5th grade	(EF05MA06) Associate the representations 10%, 25%, 50%, 75%, and 100% respectively with the tenth part, fourth part, half, three quarters, and a whole, to calculate percentages, using personal strategies, mental calculation, and calculator, in Financial Education contexts, among others.

Figure 1.

BNCC skills for the early years of Elementary Education that address the Financial Education theme directly (Brazil, 2017)

When considering FE for children who are starting their school journey, it's important to reflect on how to approach topics that are suitable to be worked on with students at this level of education, aiming at the development of FE. Oliveira (2017, p. 19) raised concerns to be considered by those responsible for addressing the theme, such as: "Who might be interested in the FE currently offered? What are the real objectives of these institutions in intending to financially educate citizens? What will be, effectively, the type of FE offered? What discussions

are provided?"

To assist in the work on the FE theme, the BNCC presents skills that should be developed with students from the 1st grade of EE. Figure 1 presents the skills that address this theme directly.

It's evident from these skills that initial financial issues are addressed so that students can understand not only income and expenses but also comprehend the different currencies that have existed in Brazil, the equivalence relationship between coins and bills of the Brazilian monetary system, and handle situations involving conscious consumption to analyze whether they can or cannot buy, whether they have money or not, whether there is a surplus or a shortage.

In the 5th grade, students are already being prepared for the later stage of EE, where they work with percentage associations and with problem situations involving money, where strategies for calculations can be applied from different topics such as interest rates, conscious consumption, inflation, deflation, among others, which are important for adult life.

It's important to note that in the BNCC, there are other skills in which the FE theme can be explored, and it is from these skills that one can perceive a concern on the part of the BNCC proposal to favor competencies (pointing out learning expectations) related to financial themes in the pursuit of more conscious consumption practices, articulating mathematical axes in problem situations (Oliveira, 2017).

In this sense, the role of the school in providing opportunities for students to work on FE in the school environment becomes important. It is up to the teacher to seek didactic strategies so that, based on these skills, they can develop FE with their students from different content areas throughout each school year.

It's worth noting that in the BNCC (Brazil, 2017), the discussion about the Financial Education theme is presented as a transversal and integrative theme for teaching in various areas of knowledge. Thus, the FE theme should be addressed in all curriculum components, and it is the role of schools and educational systems, within their possibilities, to present it in a contextualized manner, with problem situations that are interesting for the financial education of students.

The reference framework for financial literacy, as established by PISA in 2021, emphasizes the need to provide equal opportunities. It highlights the importance of offering Financial Education not only to the most advantaged students but also to those who would not otherwise have access to it. In this sense, schools play a fundamental role in promoting Financial Education among all demographic groups, contributing to reducing gaps and inequalities in this area, including among generations.

In the early years of EE, the work should be initial and focused on building basic concepts related to FE, as observed in the 2012 PISA assessment, which presents a simple question about what to do with the credit card PIN (Figure 2).

New Bank Card

Luísa lives in Zedland. She receives this new bank card.

Question 1

The day after, Luísa receives the Personal Identification Number (PIN) from the bank. What should Luísa do with the PIN?

a) Write the PIN on a piece of paper and keep it in her wallet.
b) Tell the PIN to her friends.
c) Write the PIN on the back of the card.
d) Memorize the PIN.

Competency: Recognize the importance of handling financial matters involving card usage.

Figure 2.

PISA question for Early Years of Elementary School addressing credit card (PISA, 2012)

This question does not present a high level of complexity but aims for the child to recognize a safe practice when using a password-protected card, as well as to assess the risk and reward involving financial matters.

In another question of this assessment, students are challenged to read the data from a credit card statement and identify the information present in this document. Figure 3 illustrates a credit card statement, providing students with the opportunity to explore each item present in it. The teacher can conduct simulations and develop situations that generate questions for the students based on the data and information contained in the statement. This allows for a practical and applied approach to the content, promoting understanding and engagement among students.

Sara receives this statement by mail:

Boas Compras

Fatura
Número da Fatura: 2034
Data de emissão: 28 de fevereiro

Sara Santos
Rua da Esperança, 100
Bairro do Sol
Zedlândia 0310

Boutique Boas Compras
Rua do Desconto, 10
Bairro Alvorada
Zedlândia 0320

Código do Produto	Descrição	Quantidade	Custo Unitário	Total (excluindo imposto)
C011	camiseta	3	20	60 zeds
J023	*jeans*	1	60	60 zeds
CH002	echarpe	1	10	10 zeds

Total Excluindo Impostos:	130 zeds
Imposto 10%:	13 zeds
Taxa de postagem:	10 zeds
Total incluindo Impostos:	153 zeds
Valor Pago:	0 zeds
Total devido:	153 zeds
Data de vencimento:	31 de março

Question 1
Why was this statement sent to Sara?
a) Because Sara needs to pay this bill to Boutique Good Buys.
b) Because Boutique Good Buys needs to pay this bill to Sara.
c) Because Sara has already paid this bill to Boutique Good Buys.
d) Because Boutique Good Buys has already paid this bill to Sara.

Question 2
How much does Boutique Good Buys charge for the delivery service of clothes? Delivery fee in zeds: .....

Question 3
Sara notices that Boutique Good Buys made a mistake on the statement.
Sara bought and received two shirts, not three.
The postage fee is a fixed amount.
What will be the total amount of a new statement?
Total in zeds: .....

Competencies:
Recognize the purpose and identify complete information from a credit card statement;
Identify financial information presented involving money and transactions;
Determine the total of a new statement, taking into account various factors

Figure 3.

PISA question for Early Years of Elementary School involving interpretation of a credit card bill (PISA, 2012)

In this question, it's possible to observe different levels of demand, ranging from a basic level of identifying the reason why a person receives their bill and analyzing each of the data inserted in the invoice, to a more complex level of checking the values when altering any data

related to the value of an item on an invoice. For question 3, there is a requirement for students to perceive that decreasing the value of a T-shirt automatically reduces the value of taxes. In Figure 4, the expected development in this question is observed.

Problem data: Sara made a purchase and received her invoice. In addition to the purchased items, there is a 10% increase in value, which represents taxes plus the postage fee. Problem question: By reducing one of the T-shirts and having the postage fee as a fixed value, what will be the final value of the invoice? Expected student response: 2x20+1x60+1x10 =110 zeds being this the value of the purchases. Then, there is a 10% increase which refers to the tax 110+10%, which implies in the calculation: 110x1.1=121 zeds and finally an increase of 10 zeds which refers to the postage fee 121+10=131 zeds. Thus, the final value of the invoice should be 131 zeds. Knowledge objects involved: Four operations, numerical expressions, and percentage.

Figure 4.

Anticipation of the students' response to the "Error in the invoice" question (research)

This development is ideal for students to develop basic ideas for solving this activity that requires mathematical handling and problem interpretation.

By observing item 5 in Figure 5, it is evident that there is already an approach to the importance of saving money, in this specific case, to take a trip. This approach in the classroom can be expanded to cover other areas, eventually culminating in a family budget question or the purchase of a higher value item. This implies that the theme of economics and financial planning can be explored comprehensively, taking into account different aspects of everyday life and promoting a broader understanding of financial practices.

Money for traveling
Natália works in a restaurant 3 nights a week. She works 4 hours per night and earns 10 zeds per hour. Natália also earns 80 zeds in tips per week. Natália saves exactly half of the total money she earns per week.
Question 1 Natália wants to save 600 zeds for a vacation trip. How many weeks will it take for Natália to save 600 zeds? Number of weeks .....
Competency: Calculate the time needed to save money, planning and applying financial management.

Figure 5.

PISA question for Elementary School addressing the issue of saving money (PISA, 2012)

In this question, relationships with the labor market are addressed, establishing connections between salary earnings, expenses, and the importance of saving to achieve adequate budget planning. This question involves reading and interpreting the situation, as well as developing mathematical calculations, involving the four operations and also a numerical expression, as seen in Figure 6.

Problem data: Natália works 3 nights, 4 hours per night, and earns 20 zeds per hour; saves half of the total received; wants to save 600 zeds for a trip. Problem question: What is the number of weeks Natália will take to save 600 zeds? Expected student response: $\frac{3x4x10+80}{2} = 100\ zeds$ e $\frac{600}{100} = 6\ weeks$; Therefore Natália will take 6 weeks to save 600 zeds. Knowledge objects involved: Four operations and numerical expressions.

Figure 6.

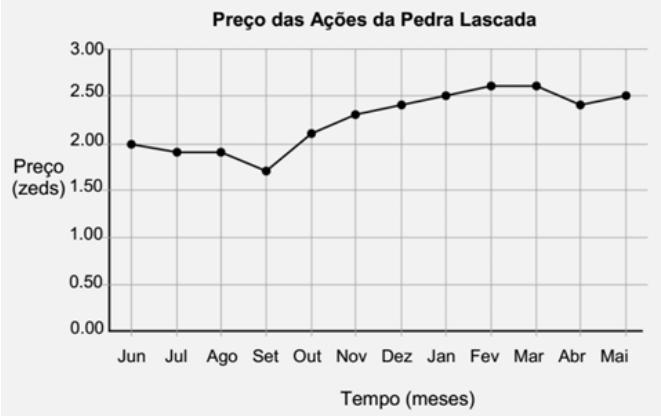
Anticipation of the students' response in the "Money for traveling" question (research)

In this question, the student must construct a numerical expression and develop mathematical concepts.

The following question is titled "stocks", but involves reading the data presented regarding the variation of the price of stocks from a mining company. Thus, Figure 7 brings a representation from interpretation and the teacher can discuss other questions with their students and analyze the prices of certain products in brochures from a local supermarket and similar questions.

Stocks

This graph shows the stock price of the mining company Pedra Lascada over a period of 12 months.



Question 1

Which of the statements about the graph are true?

Circle "True" or "False" for each statement.

Affirmation	Is this affirmation true or false?
The best month to buy the stocks was September.	True/ False
The stock price increased by about 50% over the course of a year.	True/ False

Competency: Analyze and interpret a line graph that presents stock prices over a period of 1 year, analyzing financial information.

Figure 7.

PISA question for Elementary School involving reading a graph to analyze prices (PISA, 2012)

This question involving the analysis of a graph shows the importance of being able to analyze and interpret different situations related to the topic of Financial Education.

When considering the questions presented, it becomes possible to reflect on Financial Education as a field that goes beyond Mathematics, encompassing broader knowledge. However, it is up to Mathematics teachers to play a specific role in this theme, as it serves as a basis for students to analyze and understand financial situations involving mathematical concepts. Mathematics teachers are responsible for developing the procedures and mathematical concepts necessary for students to develop financial skills, such as calculating interest, interpreting financial graphs, and understanding concepts such as budgeting and financial planning. In this way, teachers play a crucial role in integrating Financial Education within the Mathematics discipline, developing with students the ability to make financially informed decisions with a responsible attitude in the future.

Oliveira (2017) discusses the possibilities of work based on the various alternatives for planning Financial Education in the face of different curricular components, whether in Mathematics, Portuguese, Sciences, or others. From the understanding of Financial Education as a theme that seeks to promote reflection, as discussed by Muniz (2016, p. 48), "an invitation that takes into consideration the social and economic context of students, the cultural characteristics, and social singularities of the region in which they live," we recognize the importance of addressing this theme comprehensively in different disciplines present in the school curriculum. This approach aims to build a more critical awareness and a more conscious citizen practice.

By promoting discussions about Financial Education in subjects such as Mathematics, Social Sciences, Economics, among others, students have the opportunity to understand the relevance of financial issues in their daily lives and in different social and cultural contexts. This multidisciplinary approach allows students to relate financial concepts to real-life situations, stimulating critical thinking, informed decision-making, and understanding of the economic implications in their lives and in society.

Therefore, the breadth of Financial Education through various disciplines contributes to a more comprehensive education of students, equipping them not only to deal with financial issues competently but also to develop skills in analysis, questioning, and reflection regarding the socioeconomic context in which they are inserted.

Financial Education in Middle School

In the 5th grade of elementary school, it is essential to implement didactic adaptations in problems, aiming to prepare students for entry into the final years of elementary school (6th to 9th grade). From the 6th grade onwards, students face activities with a high level of

complexity. Additionally, it becomes indispensable for them to assimilate the different logics that structure the knowledge associated with various areas of learning.

It is important for teachers to revisit and reframe the learnings from the early years of elementary school in the context of different areas, aiming to provide students with a deepening and expansion of their knowledge repertoire (Brasil, 2017).

Janisch and Jelinek (2020) discuss the need to plan and work reflectively and contextually on content that encompasses Financial Education in the classroom, contemplating the content through teaching projects with relevant themes for students, enabling new knowledge, guidelines, and reflections on how to have financial organization to avoid doubts or abusive loans in the future. The authors also highlight the importance of Financial Education beyond economic aspects, considering social and cultural contexts that may contribute to the construction of different meanings, valuing and recognizing the diverse personal, professional, and social realities.

In the BNCC of middle school (Brasil, 2017), it is evident that it is up to states and municipalities to verify the applicability of themes involving conscious consumption and financial planning in different disciplines. Throughout the document, there is also concern regarding the study of students' reality, but always presenting global aspects that affect human life on a global scale.

In the BNCC document, it is stated:

> It is up to the education systems and networks, as well as schools, within their respective spheres of autonomy and competence, to incorporate into curricula and pedagogical proposals the approach of contemporary themes that affect human life on a local, regional, and global scale, preferably in a transversal and integrative way. Among these themes, [...] Financial Education stands out [...] (Brasil, 2017, p. 19-20).

Seeking to support teachers' work when planning to develop the topic of Financial Education, enabling them to develop students' autonomy and allowing them to search for knowledge related to the theme across different areas of knowledge, the BNCC presents skills in its text that can and should directly develop Financial Education. Figure 8 presents the skills that relate Financial Education directly to the field of Mathematics.

6th grade	(EF06MA13): Solve and elaborate problems involving percentages, based on the idea of proportionality, without using the "rule of three," using personal strategies, mental calculation, and calculator, in contexts of Financial Education, among others.
7th grade	(EF07MA02): Solve and elaborate problems involving percentages, such as those dealing with simple increases and decreases, using personal strategies, mental calculation, and calculator, in the context of Financial Education, among others.
8th grade	(EF08MA04): Solve and elaborate problems involving percentage calculation, including the use of digital technologies.
9th grade	(EF09MA05): Solve and elaborate problems involving percentages, with the idea of applying successive percentages and determining percentage rates, preferably using digital technologies, in the context of Financial Education.

Figure 8.

BNCC Skills for the Final Years of Elementary School that directly address Financial Education themes (Brazil, 2017)

These skills aim to develop mathematical knowledge related to Financial Education in the final years of elementary school. It is noticed that these skills already deal with terms such as increases and decreases, simple interest, proportionality, percentage rates, application of successive percentages, among other terms related to Financial Education.

It is possible to perceive that among the highlighted skills, there are different thematic units allowing the teacher to provide their students with the development of more than one thematic area at the same time while using themes related to Financial Education as a study base, in an integrated way. Thus, it is up to the teacher to develop didactic strategies that aim to engage their students with the developed themes, so that they can work on content related to the skills.

Sound System

Kelly asks her bank to lend her 2,000 zeds to buy a sound system.
Kelly has the option to repay the loan in two or three years.
The annual interest rate on the loan is the same in each case.
The table shows the amortization conditions for a 2,000 zeds loan over two years.

Payment Period	Monthly Payment Amount (zeds)	Total Payment Amount (zeds)	Total Interest
2 years	91.67	2200.08	200.08

Question 1

How will the amortization conditions for a 2,000 zeds loan over three years differ from the amortization conditions over two years? Circle "True" or "False" for each statement.
Monthly payments will be higher for a three-year loan. (True or False)
The total interest paid will be higher for a three-year loan. (True or False)

Competency: P Financial planning and management through the analysis of financial situations.

Figure 9.

PISA question directed at students in the final years of elementary school involving financial planning (PISA, 2018)

Aiming for greater integration of students with Financial Education, the teacher should address issues that spark interest in students, prompting them to seek possible solutions to their problems. In Figure 9, it can be perceived that students are already required to perform calculations involving analysis of financial situations aiming at decision-making skills.

This question involves terms aimed at working on mathematical content associated with knowledge related to Financial Education, as students need to have notions of percentages, division, interest, and amortization. Therefore, it already involves the development of skills that involve a general context. In Figure 10, the expected development in this question can be observed.

Problem Data: Loan of 2,000 zeds with options for payment in 2 or 3 years, with a fixed annual interest rate. For payment over a period of 2 years, the monthly amount in zeds is 91.67, with the final amount being 2200.08 zeds. Thus, a total interest amount of 200.08 zeds.
Problem Question: How do the payment conditions over three years differ from the amortization conditions over 2 years?
Expected Student Response: Identify the amount paid in interest annually. If in 2 years the interest was 200.08 zeds, to find the annual interest amount, it is only necessary to divide this value by 2. Thus, it is obtained that the annual interest amount is 100.04 zeds. For the period of 3 years, it is necessary to multiply the annual interest by 3, 100.04 * 3 = 300.12 zeds. By adding the interest amount over the 3-year period to the initial capital, a total of 2300.12 zeds is obtained. For equal monthly installments over a 3-year period, this amount should be divided by 36. Thus $\frac{2300,12}{36} = 63,89\ zeds$.
Therefore, it is possible to affirm that the monthly payments are lower over a 3-year period, but the final amount paid will be higher during this period.
Knowledge Objects Involved: Financial Mathematics notions associated with the four operations.

Figure 10.

Student Response Anticipation to the Sound System question (the research)

The student basically uses the four operations to solve this question, but basic knowledge of Financial Mathematics nomenclature is necessary for them to understand what each calculated value means.

In the activity represented in Figure 11, a task involving the analysis of a paycheck is carried out, allowing the teacher to explore issues related to the labor market and different professions. This activity enables students to understand the components present in a paycheck, such as salary, deductions, and benefits, as well as the discussion about the various occupations and careers available.

By using this resource, the teacher can address topics such as remuneration, working hours, labor rights, taxes, and social contributions. Furthermore, the activity stimulates students to reflect on career choices, the skills required for each occupation, and career prospects.

PAYCHECK

Every month, Joana's salary is deposited into her bank account. This is Joana's paycheck for the month of July.

PAYCHECK OF THE EMPLOYEE: Joana da Silva

Position: Manager	July 1st to July 31st
Gross Salary	2,800 zeds
Deductions	2,500 zeds
Gross salary up to this date	19,600 zeds

Question 1

How much did Joana's employer deposit into her bank account on July 31?

a) 300 zeds b) 2,500 zeds c) 2,800 zeds d) 19,600 zeds

Competency: Identify the data presented on a paycheck.

Figure 11.

PISA question for the final years of elementary school involving paycheck data (PISA, 2012)

Thus, the analysis of the payslip provides a practical and contextualized approach to issues related to the job market, allowing students to gain a broader understanding of the dynamics and challenges present in professional life.

The question represented in Figure 12 addresses the calculation of the cost price for sale, presenting a situation in which the student must analyze what would be the minimum price to sell a product in order to avoid losses for the manufacturer. To solve this question, it is necessary to apply the concept of a first-degree function, relating the production cost and expenses involved in the manufacturing of the product to the selling price.

By using this mathematical concept, students are challenged to consider cost factors such as raw materials, labor, taxes, and operational expenses, and determine the minimum price necessary to cover these costs and ensure the sustainability of the business.

Paulo owns a furniture factory. To calculate the selling price V of each piece of furniture he manufactures, he uses the following formula:
$V=1.5C+R\$10.00$, where C is the cost price of the furniture. Let's consider that the cost price of a furniture piece that Paulo manufactures is R$100.00. Therefore, he sells this furniture for:

a) R$ 110,00 b) R$ 150,00 c) R$ 160,00 d) R$ 210,00

Figure 12.

Question from the SAEB for the Final Years of Elementary School addressing the cost price for sale (INEP, 2017).

Thus, the question in Figure 12 allows students to apply mathematical knowledge in solving real problems, developing skills in analysis, interpretation, and decision-making related to the market and financial aspects of the production and sale of a product. The expected development in this question is observed in Figure 13.

Problem data: Paulo uses the formula V=1.5C+R$10.00 for the selling price of the furniture he manufactures. Problem question: Considering C as the cost price of this furniture, how much will Paulo sell a piece of furniture that he manufactures with a cost price of R$100.00? Expected student response: $V = 1{,}5C + 10$ $V = 1{,}5 \cdot 100 + 10$ $V = 150 + 10$ $V = R\$\,160{,}00.$ Knowledge objects involved: Basic concepts of algebra (Algebraic expressions, Operations) and Function.

Figure 13.

Student Response Anticipation to the question about the cost of a piece of furniture (the research)

This development is expected of the students so that they can successfully tackle this activity, requiring interpretation of the problem, basic knowledge of algebra, and functions, as the higher the cost price of the furniture, the higher its selling price. In other words, there is a dependency relationship between the variables.

The question presented in Figure 14 involves a relationship between the total cost provided by the problem, and the goal is to determine the quantity of machines that generated this value. In this case, the student needs to develop a second-degree function and analyze the obtained answers.

By constructing the second-degree function, students can explore the variables involved, such as the total cost and the quantity of machines, and establish a mathematical relationship between them. From this function, they can solve the equation and determine the possible quantities of machines that result in the total cost provided by the problem.

The cost of a production, in thousands of reais, of x identical machines is given by the expression $C(x) = x^2 – x + 10$. If the cost was 52 thousand reais, then the number of machines used in the production was
a) 6 b) 7 c) 8 d) 9

Figure 14.

Question from SAEB for the Final Years of Elementary School involving manufacturing cost question (INEP, 2011)

This question requires the student to understand the presented data, as well as the ability to solve a second-degree equation and analyze the data presented. In this question, the final cost value is already given, and the student must manipulate the equation algebraically so that they can then solve and analyze the situation. In Figure 15, the expected development in this question can be observed.

Problem Data: The cost of production of x machines, in thousands of reais, is given by the expression $C = x^2 - x + 10$.
Problem Question: If the cost is R$ 52,000.00, how many machines were used in the production?
Expected Student Response:$C(x) = x^2 - x + 10$

$52 = x^2 - x + 10$

$0 = x^2 - x - 42$

$x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4 \cdot 1 \cdot (-42)}}{2 \cdot 1}$

$x = \frac{1 \pm \sqrt{169}}{2}$

$x = \frac{1 \pm 13}{2}$

$x' = \frac{1+13}{2} = 7$

$x'' = \frac{1-13}{2} = -6$

As the number of machines cannot be negative, the quantity of machines used was 7.
Knowledge Objects Involved: Equation and Function.

Figure 15.

Student Response Anticipation to the question about the number of machines used in a production (the research)

The FLE can help students develop these skills by teaching them to create budgets, manage debts, and invest wisely. Additionally, FLE can help people avoid common financial traps such as credit card debt, predatory loans, and fraud. In summary, the ability to perform financial calculations and apply them in everyday situations is an essential skill that should be taught from childhood, and FLE can be a valuable tool to empower people to make more informed and conscious financial decisions.

Research Methodology

This article originates from a segment of a doctoral thesis centered on the theme of Financial Education in Basic Education. The methodological approach adopted was qualitative, as it allows for an in-depth and interpretative analysis of the phenomena in question, as suggested by Creswell (2014).

The study was conducted with the participation of 40 students from the early years of Elementary School (4th and 5th grades) in the city of Canoas. These students were selected based on their availability and interest in participating in the "Mathematics Day," an annual event promoted by the Lutheran University of Brazil in Canoas/RS, which aims to engage students in practical and interactive mathematical activities. The average age of the participants was 11 years old.

During the event, the students were divided into 10 groups of 4 students each. They participated in a scavenger hunt where the responsible teachers presented various situations

involving mathematical content. Among these, a specific activity was dedicated to the FLE theme. This activity was designed to help students explore basic concepts of personal finance, such as savings, budgeting, and conscious spending. The activity, which lasted about 1 hour, was structured in a playful and interactive way, allowing students to apply financial concepts in everyday situations.

Analysis of Activities

The 40 students who participated in the Math scavenger hunt initially had a moment with teachers who addressed different topics in the field of Mathematics. The students received the 4 FLE activities, as referenced, to be developed with students from the early years of Elementary School (Figure 2, Figure 3, Figure 5, and Figure 7). The analysis presented is of each question developed by the groups.

Below, in Figure 16, it is possible to observe the number of correct answers presented in the questions.

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
Figure 2										
Question 1	X	X	X	X	X	X	X	X	X	
Figure 3										
Question 1	X	X	X	X	X	X	X	X	X	X
Question 2	X		X					X		
Question 3										
Figure 5										
Question 1	X			X	X	X		X	X	X
Figure 7										
Question 1	X		X				X			
Question 2	X		X	X	X		X			

Figure 16.

Correct answers in the activities applied with students (research data, 2023)

The first activity conducted was the one presented in Figure 2. In this activity, students were supposed to analyze what to do when receiving a bank card PIN. Nine out of the 10 groups marked the correct alternative, which was "Memorize the PIN," although some commented that

they knew people who did differently. One group answered that the correct action was to write down the PIN on a piece of paper and keep it in the wallet. However, upon discussing with the students, they realized that keeping it in the wallet could be dangerous because if the wallet gets lost, someone could access the card and the card's PIN.

The second activity conducted (Figure 3) involved a bill that was sent by mail. In this activity, students had 3 questions to analyze. 1 - Why was the bill sent to Sara? 2 - How much is charged for the clothing delivery service? 3 - After noticing an error in the bill, considering that the postage fee is fixed, what will be the new bill amount?

Regarding the reason why the bill was sent to Sara, the groups correctly answered that Sara received the bill because she is the one who needs to pay the store's bill.

Regarding the second question about the value of the delivery service, only 3 groups understood that the information was on the bill and the value was 10 zeds. 3 groups did not answer this question. 3 groups answered that the amount charged for the delivery service was 153 zeds, demonstrating that they understood the total amount with tax as the amount charged by the company for the delivery service, and one group stated that the amount was 90 zeds without providing a justification for the answer.

In the last question of this activity, Sara had noticed an error in her bill because she received 2 shirts instead of 3 shirts as presented on the bill. Figure 4 shows the anticipated resolution intended by the students. However, none of the groups answered this activity correctly. Upon analyzing the groups' responses, it was possible to observe that: 2 groups subtracted 20 zeds, which was the unit value of the shirt, and answered that the new bill amount was 133 zeds, but they did not consider that a change in the value would result in a change in the tax amount; 4 groups stated 20 zeds, i.e., they followed the same line as the previous ones and only thought about reducing the value of one shirt; 3 groups did not answer the activity, and 1 group stated 130 zeds but did not explain why this value. It is worth noting that none of the groups attempted to elaborate on a resolution of this activity, thus making a deeper analysis of the reasoning used for the answers unfeasible.

Analyzing this situation, one understands the concerns of Oliveira (2017) as already mentioned, because when EFE is thought of superficially, it is common to think of tasks that relate to issues involving interest, extra or undue charges. But in this question, students should identify and analyze the information on the bill to answer the amount charged for the delivery service and, in the following question, how to calculate the bill amount if there is an error in the bill.

Also, in situations like this, it is clear that EFE is not only related to the field of

Mathematics because reading and analyzing the data presented on a bill goes beyond issues involving mathematical calculations. Thus, the importance of discussing the BNCC regarding EFE as a transversal and integrative theme for teaching in various areas of knowledge is emphasized, being addressed in all curriculum components. In addition, the BNCC emphasizes that it is the role of schools and education systems, within their possibilities, to develop EFE in a contextualized manner, with problem situations that are interesting for the financial education of students.

Regarding the third activity carried out by the students (Figure 5), it is possible to verify that 7 groups answered correctly, paying close attention to the problem statement. In this question, it was necessary for the students to understand that each night worked by Natália earned her a total of 40 zeds, and since she worked 3 nights, she earned a total of 120 zeds. Additionally, there was the tip, which was a fixed weekly amount of 80 zeds, thus totaling 200 zeds per week. As she saved half of the weekly total, she saved 100 zeds. Aiming for a total of 600 zeds, she needed 6 weeks to reach that amount. The 3 groups that answered incorrectly stated 3 weeks, i.e., it can be observed that there was an error in reading the statement because they did not interpret that she only saved half of the weekly amount, i.e., 100 zeds per week.

In Figure 17, the different ways in which the groups organized their thoughts can be observed.

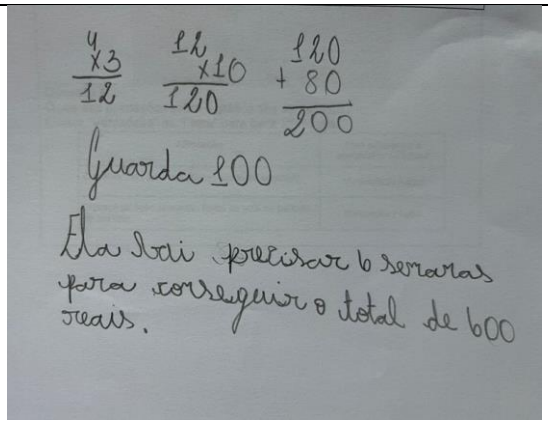
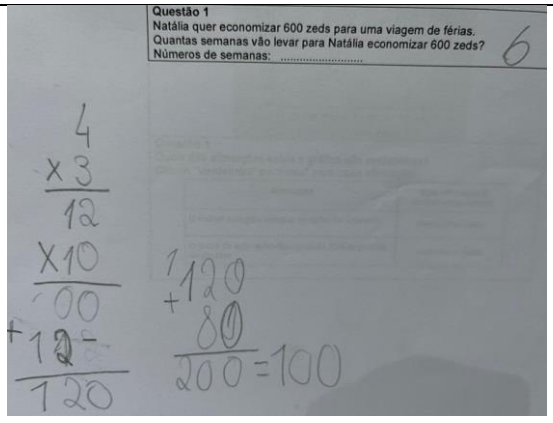
Group 6	Group 8
	

Figure 17.

Presentation of the resolution of 2 student groups (research data, 2023)

It is possible to observe that the groups thought similarly about constructing the resolution of this activity, multiplying the 3 days of work by the 4 hours per day. Then,

multiplying the result by 10, which was the value, in zeds, of the hourly wage. Finally, they added the 80 zeds tip, thus totaling the 200 zeds for the week. As they saved half, both groups understood that they saved 100 zeds per week. Therefore, to reach the amount of 600 zeds, it was necessary for a period of 6 weeks.

In this question, the need for articulation between mathematical thinking with reading and interpretation of the problem is evident, and articulating this from the early years of elementary school becomes important to value situations that stimulate students to develop a critical way of reading and interpreting phenomena (Brazil, 2017).

In the last question conducted by the students (Figure 7), it initially involved the analysis of a graph that presented a comparison of the stock prices of a certain company over a year. After an initial analysis, the students must verify if September was indeed the best month to buy the stocks of that company and later if the stock had increased by 50% in the period of one year. It is possible to notice that only 3 groups answered the question about the best month to buy the stocks correctly, and here it is necessary to analyze the understanding of what it means to buy a company's stock, so that the student can better understand and analyze the situation. Regarding the question of the price increasing by 50% in one year, half of the groups answered correctly, and here it is worth mentioning that some groups could not associate 50% with the concept of half, so they did not understand the question very well.

Final Considerations

Throughout the activities carried out, difficulties were observed among students in the early years of elementary school regarding the interpretation of the proposed questions. Specifically, this difficulty was observed in an item where there was a reduction in the bill, and the students did not understand that this reduction in the value of the purchases would also result in a reduction in the value of the taxes. Furthermore, another question that posed obstacles for the students was the one where it was necessary to determine the amount charged by the store for the merchandise delivery, as they had difficulties locating this information on the bill.

In the last activity conducted, a lack of understanding was noticed on the part of the students regarding the concept of buying stocks, as well as difficulties in analyzing the

percentage increase in the value of these stocks.

Such errors highlight the importance of addressing themes that can integrate the early years of elementary school in a school context, with the aim of promoting analysis and reflection on the role and development of these initiatives in contemporary consumer society.

Financial Education is an important theme for reflection and discussion with students because this theme allows connections between mathematical contents developed in the classroom and issues of personal life (such as consumption and society), professional life (such as labor issues), and social life (such as ethics and sustainability) (Olgin & Groenwald, 2018).

It is the responsibility of the teacher to develop teaching strategies that address this theme with their students, in order to avoid confusion between Financial Education and Financial Mathematics. As discussed by Veiga (2019), Financial Mathematics is a set of knowledge dedicated to the study of money variations over time, using mathematical techniques to solve problems related to cash flow and capital equivalence, under simple and compound interest regimes. The author also highlights that Financial Education, in turn, is based on the critical analysis of specific situations involving financial resources, with the aim of guiding appropriate decision-making for everyone.

As mentioned earlier, Financial Education is an important cross-cutting theme that can be included in all areas of knowledge. This helps ensure that the theme is approached in an interdisciplinary manner.

Based on the investigation, some suggestions are presented for working on Financial Education in Basic Education schools:

• Include Financial Education in the curriculum: Develop a Financial Education curriculum that includes basic concepts and skills, such as personal budgeting, financial planning, economics, investments, and entrepreneurship.

• Use real-world examples: Use real-world examples to help students understand how Financial Education concepts apply to their daily lives. For example, work on how to budget for grocery shopping or discuss investment options for long-term savings.

References

Brasil. Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira. Programa

Internacional de Avaliação de Estudantes. (2012). Letramento financeiro. https://download.inep.gov.br/acoes_internacionais/pisa/itens/2015/letramento_financeiro_portugues_pisa.pdf.

Brasil. Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira. Programa Internacional de Avaliação de Estudantes. (2018). *Letramento financeiro*. https://www.gov.br/inep/pt-br/areas-de-atuacao/avaliacao-e-exames-educacionais/pisa/testes-e-questionarios.

Brasil. Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira. (2017). *Exame Nacional do Ensino Médio. https://download.inep.gov.br/educacao_basica/enem/provas/2017/cad_7_prova_azul_12112017.pdf*

Brasil. Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira. (2011). *Exame Nacional do Ensino Médio. https://download.inep.gov.br/educacao_basica/enem/provas/2011/05_AMARELO_GAB.pdf*

Brasil. Ministério da Educação. (2017). *Base Nacional Comum Curricular: Educação é a Base*. Brasília. http://basenacionalcomum.mec.gov.br.

Brasil. Ministério da Educação. (2019). *Temas Contemporâneos Transversais na BNCC: Proposta de Práticas de Implementação*. Brasília. http://basenacionalcomum.mec.gov.br/images/implementacao/guia_pratico_temas_contemporaneos.pdf.

Creswell, J. (2014). *Investigação Qualitativa e Projeto de Pesquisa: escolhendo entre cinco abordagens.* Porto Alegre: Penso.

Janisch, A. B. L.; Jelinek, K. R. (2020) Explorando a educação financeira no ensino fundamental: um estudo de possibilidades a partir das orientações da BNCC. *Brazilian Journal of Development*, v. 6, n. 7, p. 48324-48342. https://ojs.brazilianjournals.com.br/ojs/index.php/BRJD/article/view/13478/11296.

Muniz, I. J. (2016). *Econs Ou Humanos? Um Estudo Sobre a Tomada de decisão em Ambientes de Educação Financeira Escolar*. [Tese de Doutorado em Engenharia de Produção, Universidade Federal do Rio de Janeiro]. http://objdig.ufrj.br/60/teses/coppe_d/IvailMunizJunior.pdf.

OCDE. Directorade for Financial and Enterprice Affairs. (2005). *Recommendation on Principles and Good Practices for Financial Education and Awareness.* http://www.oecd.org/finance/financial-education/35108560.pdf.

Olgin; C. A; Groenwald; C. L O. (2018) Educação Financeira no currículo de Matemática do Ensino Médio. *Revista Brasileira de Ensino Ciência e Tecnologia*, v. 11, n.2, p. 368-390. https://periodicos.utfpr.edu.br/rbect/article/view/8433.

Oliveira, A. A**.** (2017) *Educação Financeira nos Anos Iniciais do Ensino Fundamental: como tem ocorrido na sala de aula?* [Dissertação de Mestrado em Educação Matemática e Tecnológica, Universidade Federal de Pernambuco, Recife]. https://repositorio.ufpe.br/bitstream/123456789/32214/1/DISSERTA%C3%87%C3%83O%20Anaelize%20dos%20Anjos%20Oliveira.pdf.

Veiga, A. M. (2019). *Educação Financeira no Ensino Médio: uma proposta de curso de extensão para os acadêmicos da licenciatura em Matemática.* [Dissertação de Mestrado em Ensino de Ciências e Matemática, Universidade Luterana do Brasil].

http://www.ppgecim.ulbra.br/teses/index.php/ppgecim/article/view/349/344.