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Educação Matemática Debate

Sustainable School Financial Education: a possibility in the Early Years of Elementary School

Abstract: School Financial Education is a subject that has yet to be widely disseminated in Brazil, although indicated in official documents. That said, there is a lack of material aimed at children. This research is justified by proposing a Teaching Guide that seeks to respond to the problem of how to work on Sustainable School Financial Education in the Early Years of Primary School. This paper aims to present the results of a doctoral research project that looked at *the value of things, the fundamental and the superfluous, ethics, economics, and sustainability*. The methodological approach applied was Didactic Engineering. The main result was confirmation of the hypothesis that students aged between 7 and 9 can work on the themes and put their learning into practice.

Keywords: School Financial Education. Sustainability. Elementary School.

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Article

Educación Financiera Escolar Sostenible: una posibilidad en los Primeros Años de Primaria

Resumen: La Educación Financiera Escolar es un tema poco extendido en Brasil, aunque está indicado en documentos oficiales. Dicho esto, hay una falta de material dirigido a los niños. Esta investigación se justifica proponiendo una Guía Didáctica que pretende dar respuesta a la problemática de cómo trabajar la Educación Escolar y Financiera Sostenible en los primeros años de la escuela primaria. Este artículo tiene como objetivo presentar los resultados de la investigación doctoral, que abordó: 'El Valor de las Cosas', 'Fundamental y Superfluo', 'Ética', 'Economía y Sostenibilidad' estos estudiantes. La trayectoria metodológica aplicada fue la Ingeniería Didáctica. El principal resultado fue la confirmación de la hipótesis de que los estudiantes de entre 7 y 9 años pueden trabajar los temas y poner en práctica sus aprendizajes.

Palabras clave: Educación Financiera Escolar. Sustentabilidad. Educación Primaria.

Educação Financeira Escolar Sustentável: uma possibilidade nos Anos Iniciais do Ensino Fundamental

Resumo: A Educação Financeira Escolar é uma temática pouco difundida no Brasil, apesar de indicada nos documentos oficiais. Isso posto, verifica-se a carência de material voltado ao público infantil. Esta pesquisa justifica-se ao propor um Guia Didático que visa responder à problemática de como trabalhar a Educação Financeira Escolar Sustentável nos Anos Iniciais do Ensino Fundamental. Este artigo tem como objetivo apresentar resultados de uma pesquisa de doutorado que abordou: *o valor das coisas*, *fundamental e supérfluo*, *ética*, *economia e sustentabilidade*. O percurso metodológico aplicado foi a Engenharia Didática. O principal resultado foi a confirmação da hipótese de que os alunos na faixa etária entre 7 e 9 anos podem trabalhar as temáticas e colocar em prática o aprendizado.

Palavras-chave: Educação Financeira Escolar. Sustentabilidade. Ensino Fundamental.

1 Introduction

Considering the growing processes of social indebtedness that directly affect consumer

relations, the capitalist mode of production has implemented a series of assumptions that directly harm the environment. This produces a chain of successive disastrous actions from an economic point of view, as well as in terms of sustainability and the balance of collective subjectivity. In this respect, the elements involved in this study concern the tensions problematized by the relationship between school education and Financial Education in this environment. This is a theoretical-methodological perspective which, as a doctoral study, presents itself as innovative in its basis for analysis and research.

It is also worth noting the weakness of the educational system, which, despite the core curricula pointing out the need for this study in primary education, does not implement programs that are directly attentive to social and family demands that result in a balanced promotion of personal finances in the face of the human needs presented in everyday life. This directly affects concerns about the awakening of education that, in an emancipated way, can contribute to developing a culture of fiscal balance, starting from individual consumer relations to the collective.

When it comes to the Early Years of Primary School, the subject of this study, it is essential to start habits and behaviors from an early age that generate reflection on consumption and decision-making about what sustainability means in its essence. With this, even though managing resources is the main target of School Financial Education, its implementation and philosophical conceptualization still do not meet a collective transformation that involves the prudence necessary to guarantee a daily life regarding economic security. In this respect, *having* and *being*, in the light of Bauman (2008), has a direct relationship with individuality and with modes and patterns of behavior that result in consumption and production.

It is valid to assume that the approach to school financial education is based on the constitutional principle (Brasil, 1988), according to Article 205, which determines the school's vital role in forming critical and reflective citizens who are aware of their actions and capable of making decisions within society. In other words, the institution must promote an education that seeks to make the subject aware of the appropriateness of financial and natural resources from an early age.

In this regard, the research bases the theme of School Financial Education in the Early Years on Bauman (2008), presents the unprecedented concept of Sustainable School Financial Education, develops activities with problems related to the theme based on the curriculum proposal drawn up by Silva and Powell (2013); analyzes all the production acquired through Artigue's Didactic Engineering methodology (1996); and, finally, presents an Educational Product in the format of a Teaching Guide, with proposals for activities related to the themes of money, value and price, ethics, consumption and the environment.

2 Theoretical Path

The reflections presented here address issues of economics and sustainability to understand, as Bauman (2008) suggests, the sociological development of human thought and behavior about consumption. In this context, individuals try to follow the consumption patterns promoted by capitalism to feel a sense of belonging. This justifies the importance of including Financial Education in schools.

In Brazil, School Financial Education was introduced as a Cross-Cutting Theme in the *Parâmetros Curriculares Nacionais para o Ensino Médio* [Brazilian National Curriculum Parameters for Secondary Education] — PCNEM (Brasil, 2000). Recently, the *Base Nacional Comum Curricular* [Brazilian National Common Curriculum Base] — BNCC (Brasil, 2018)

reaffirmed the importance of School Financial Education, maintaining it as a Cross-Cutting Theme. Melo *et al.* (2021) analyzed the BNCC in search of skills that dialogue with Financial Education since it does not provide explicit guidelines on how to approach this topic.

Melo *et al.* (2021) found skills in all areas of knowledge — except foreign language — that can be worked on and deepened from the perspective of School Financial Education, for example, the interpretation and production of advertisements that induce consumption. The authors also indicate the type of problematization that can occur in the approach to each skill highlighted. However, School Financial Education is a curriculum proposal that Silva and Powell (2013) developed, which suggests reflections and approaches divided into four axes.

The first strand, entitled *Basics of Finance and Economics*, aims to promote a discussion about money and its role in society, including financial products and institutions. The second strand, *Personal and family finance*, proposes ways of planning and managing personal and family finances, such as the household budget and financial obligations. The third strand, called *Opportunities*, highlights *consumer traps*, which, according to the authors, are marketing strategies for promoting consumption. This axis also includes investment opportunities. The fourth and final axis is entitled *The social, economic, political, cultural and psychological dimensions surrounding Financial Education*. This axis underpins and directs the doctoral research, which is presented concisely, as it contains themes related to consumption and consumerism, waste production and environmental impact, wages, social classes and social inequality, need *versus* desire, ethics and money (Silva and Powell, 2013).

Based on this curriculum proposal, the researchers developed a *Sustainable School Financial Education* concept based on concerns about the relationship between consumption and the environment. This encourages reflection on society's responsibility to consume without considering environmental impacts, such as waste disposal and the use of natural resources.

Based on Law No. 12.305, of August 2, 2010 (Brasil, 2010), which promotes the National Solid Waste Policy, and the agreements of the 2030 Agenda for Sustainable Development, the researchers conceptualize Sustainable School Financial Education as a reflection on consumption options and the environmental impacts present in the production available on the market, choosing those whose production is attentive to environmental issues, as well as demanding reverse logistics from companies, as advocated by Law No. 12.305/2010.

To analyze the scenario, the researchers conducted a Systematic Literature Review based on Kitchenham (2004), intending to map the paths taken and the artifacts produced for the research question: How *can we work on Sustainable School Financial Education themes in the Early Years of Primary School, with a focus on concern for the environment?*

Initially, we examined official documents, such as the BNCC and the PCNEM, to analyze the skills related to Financial Education.

The process of a Systematic Literature Review involves a number of stages aimed at planning and carrying it out, i.e., creating a protocol. The research sources were concentrated in the Theses and Dissertations Database of the Coordination for the Improvement of Higher Education Personnel (CAPES) and Google Scholar from 2015 to 2021. The inclusion criteria were papers published in Qualis A journals. The search strings were: Financial Education, School Financial Education, Early Years, and Elementary School. The booleans and logical connectives used were *and* and *or*.

The results obtained by the researchers were organized in Table 1 according to their categorization.

Table 1: Research on Financial Education (2015-2021)

Categories	Number of Surveys	
	Papers	Thesis
Elementary School (early years)	8	0
Elementary School (final years)	16	1
High School	6	2
Youth and Adult Education	0	0
Textbook analysis (Elementary II)	5	1
Financial Mathematics	0	0
Teacher Training	5	9
Curriculum	4	1
Graduation	0	4
Literature Review	2	1
Total	46	19

Source: Research data

As exclusion criteria, the following were disregarded: works applied to audiences with different age groups from the research (Early Years of Elementary School), dissertations, course completion works, teacher training, and analysis of teaching materials. After applying the inclusion and exclusion criteria, the selection resulted in eight papers, as described in Table 2.

Table 2: Financial education research (2015-2019)

Authors	Title	Year	Publication
Joseilda Machado Mendonça; Cristiane Azêvedo Pessoa	School Financial Education in Early Childhood Education: teacher and child materials	2021	Journal of Science and Mathematics Education Qualis A2
Cristiane Azevêdo dos Santos Pessoa; Laís Thalita Bezerra dos Santos	Financial Education activities from the perspective of Skovsmose's Learning Environments	2019	Revista Educação Matemática Pesquisa Qualis A2
Laís Thalita Bezerra dos Santos; Cristiane Azevêdo dos Santos Pessoa	How are the themes of school financial education in the early years of primary education presented in mathematics textbooks?	2020	Journal of Education in Science and Technology Qualis A2
Beatriz Oliveira do Livramento; Cristiane Azevêdo dos Santos Pessoa; Laís Thalita Bezerra dos Santos	How are early years mathematics textbooks approaching Financial Education after including this theme in the BNCC?	2021	Electronic Journal of Mathematical Education Qualis A2
Glauciane Vieira; Marilene Oliveira; Cristiane Azevêdo dos	Financial Education: analysis of MEC textbooks for the early years	2019	Multidisciplinary Journal of Education Qualis A4

Santos Pessoa			
Laís Thalita Bezerra dos Santos; Cristiane Azevêdo dos Santos Pessoa	Relationships between Financial Education activities in mathematics textbooks for the early years of elementary school and the teacher's manual	2018	Journal of Iberoamerican Mathematical and Technological Education Qualis A4
Luciana Troca Dantas; Barbara Cristina Mathias Santos; Giseli Capaci Rodrigues; Chang Kuo Rodrigues	Educating and caring: a possible action between finance and the environment	2017	Teaching, Health and Environment Journal Qualis A2
Barbara Cristina Mathias dos Santos; Adriane Melo de Castro Menezes; Chang Kuo Rodrigues	Is Finance a Child's Subject? A Proposal for Financial Education in the Early Years	2016	Boletim online de Educação Matemática Jornal Qualis A4

Source: Research data

Based on the Systematic Literature Review, the researchers concluded that teaching Financial Education needs more applied in the Early Years, corroborating the research development presented.

Another theoretical path relates to Science, Technology, and Society (STS) education, whose approach allows science to be considered in a broader social context, promoting training for the exercise of citizenship. STS education does not aim to replace science education but rather to associate themes related to effective and conscious participation in the society where the subject is inserted. The research, therefore, addresses issues related to the use of natural resources.

Thus, the research highlights the importance of the consequences of technological progress. Santos (2012) points out that for an "approach to be characterized as STS, a multidisciplinary discussion is needed, exploring the issue from an economic, social, political, cultural, environmental and ethical point of view" (p. 58). Bauman (2008) warns of the devaluation of quickly discarded goods, promoting a volume of hazardous waste, since many electronic devices have harmful elements in their composition that can affect the soil and, consequently, the water table.

3 Methodological Paths

The survey was applied to students in the Early Years of Primary School, aged between 7 and 9, at a public school in the city of Duque de Caxias. The school is located in a neighborhood far from the city's commercial center and is characterized by several companies and a community. The neighborhood needs more assistance, as there is no public transport or health unit, so the school is the only public facility the community has access to. The school serves around 600 students enrolled from kindergarten to 9th grade.

Two methodologies were used to carry out the research. The first, Brousseau's Theory of Didactic Situations (1996), was used to construct the interventions carried out with the students. The second methodology adopted was Artigue's Didactic Engineering (1996), which guided the preliminary analysis and subsequent validation.

Theory of Didactic Situations

The choice of this methodology is justified by the possibility of stimulating research behavior in the student. The learning process is developed in four stages: Action, Formulation, Validation, and Institutionalization. In the Action didactic situation, the teacher presents the problem situation, and the students use their previous knowledge to develop their strategies to solve it.

The Formulation didactic situation is the moment when the student interacts with the environment, i.e., they exchange with their peers without the teacher's intervention. The Validation teaching situation, meanwhile, allows each hypothesis formulated to be tested and promotes debate and argumentation.

Finally, in the didactic situation of Institutionalization, the teacher takes control of the process, promoting analysis and synthesizing the solutions presented by the students, transforming the knowledge into formal knowledge.

Based on the stages of Didactic Situation Theory, the researchers developed five activities aligned with the curriculum proposed by Silva and Powell (2013), identified in axis 4: social, economic, political, cultural, and psychological dimensions involving Financial Education.

Didactic Engineering

This methodology is characterized by scientific investigation to extract the didactic relationships that occur in the classroom (Artigue, 1996). The author justifies the name chosen for this methodology by the fact that didactic work is similar to that of an engineer in that both rely on specific knowledge and complex objects of science.

Didactic Engineering is organized into four stages, defined as follows:

- Preliminary analysis: at this stage, the theoretical references are mapped; the difficulties and obstacles of scientific knowledge are identified; and the object in question is delimited. The three dimensions present in the research are described: the epistemological dimension, which presents a description of everything related to the knowledge at stake; the didactic dimension, which points out the knowledge contained in the local aspect; and the cognitive dimension, which lists the characteristics of the research subjects and the place in which they are inserted;
- Design and *a priori* analysis: describes the macro didactic and micro didactic variables pertinent to the problem studied, presenting the activities that will be proposed and the possibilities of data that can be collected at the time of experimentation;
- Experimentation: This is related to the application of the didactic situations developed by the researchers, according to the Theory of Didactic Situations defined by Brousseau (1996);
- *A posteriori* analysis and validation: This allows the researcher to interpret the data collected and compare it with the data from the a priori analysis based on the research's guiding question.

To better describe the previous analyses, we highlight the epistemological dimension of the research, which brings together a survey on Financial Education around the world based on the recommendations of the Organization for Economic Cooperation and Development (OECD) of good practices for Financial Education in the school environment. In terms of the didactic dimension, the research brings together publications on School Financial Education in

Brazil, with the main source being the *Estratégia Nacional de Educação Financeira* [National Strategy for Financial Education — ENEF], which promotes the dissemination of didactic material. It also cites productions developed by the Securities and Exchange Commission aimed at young people. As for the cognitive dimension, the researchers explain that the Research Ethics Committee approved the research since it was applied to students in the Early Years of Primary School at a public school in a city in southeast Brazil.

In the first meeting with the class, some questions were asked with the aim of gathering the students' concepts and perceptions of certain topics. The first question was about the social function of money. When asked what money was used for, almost all the students answered: *to buy something*. Another question was about who had invented money. At this point, it was possible to see that most of the children believe that all creations are the work of a deity, as many of them identified Jesus or God as the creators of money. Only three students hypothesized that it could be a coin or money factory, and two students attributed the creation to the president of the republic at the time.

Another analysis carried out by the researchers aimed to find out what relationship the students had between money and happiness, using the question: *Do we need a lot of money or a little money to be happy?* It was possible to see a balance between a lot's and a little's answers. Very few students mentioned the relationship between happiness and money in an unrelated way, attributing happiness to dreaming and believing in God.

The researchers wanted to understand what associations students made between money and work. From the question, "*How do we make money?*". The researchers found that the main answer was work. One student said that all you had to do was get money from the bank, while another said that you had to go to the lottery and play.

Another activity investigated the analogy between dreams and the future. The researchers asked the students what their dream would be. Two-thirds of the students indicated that their dream was to have a job or a profession in the future, while the rest just wanted to get rich.

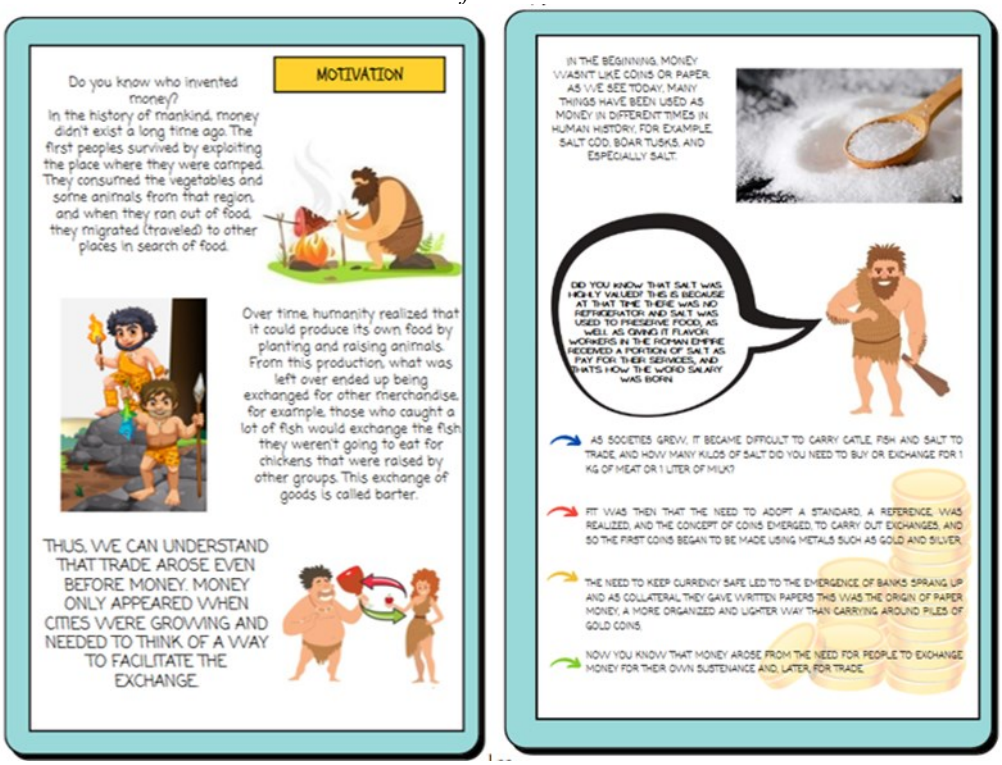
The issue of consumption and its environmental consequences was also the subject of investigation. In the survey, after briefly considering consumption and the environment, the researchers asked whether high consumption could impact the planet. The answer was almost unanimous: the students indicated *yes*, high consumption could harm the Earth, but they couldn't indicate or exemplify exactly how. Only a few students mentioned that resources could run out, and nothing would be left to buy.

The next stage, Construction and *a priori* analysis aims to identify the macro and/or micro didactic variables pertinent to the topic studied. From a macro-didactic perspective, the research developed five didactic situations involving the School Financial Education theme based on the curricular proposal by Silva and Powell (2013). These activities have been compiled into a Teaching Guide, which can be used digitally and in print to facilitate remote access to the activities. You only need one copy of the Guide in PDF format to carry out the activities.

All the activities proposed in the Guide were designed for collaborative work in accordance with the Brazilian Inclusion Law No. 13.146, of July 7, 2015 (Brasil, 2015), which establishes collaborative work as one of the precedents for access to the curriculum. The Guide provides opportunities for inclusion and suggests easily accessible materials such as magazines, supermarket inserts, and common school materials such as paper, glue, scissors and pens.

The first chapter aims to reflect on the origin of money and its use in history. The activity, entitled *Where does the money come from?*, is scheduled to take 50 minutes and involves dividing the students into groups so that each one is responsible for different consumer items. The groups have to barter with each other, simulating a barter operation, without the teacher's interference, this being the specific moment for the end of the activity, as illustrated in Figure 1.

Figure 1: Illustration of part of the Guide (didactic instructional material) on the topic *Where does money come from?*



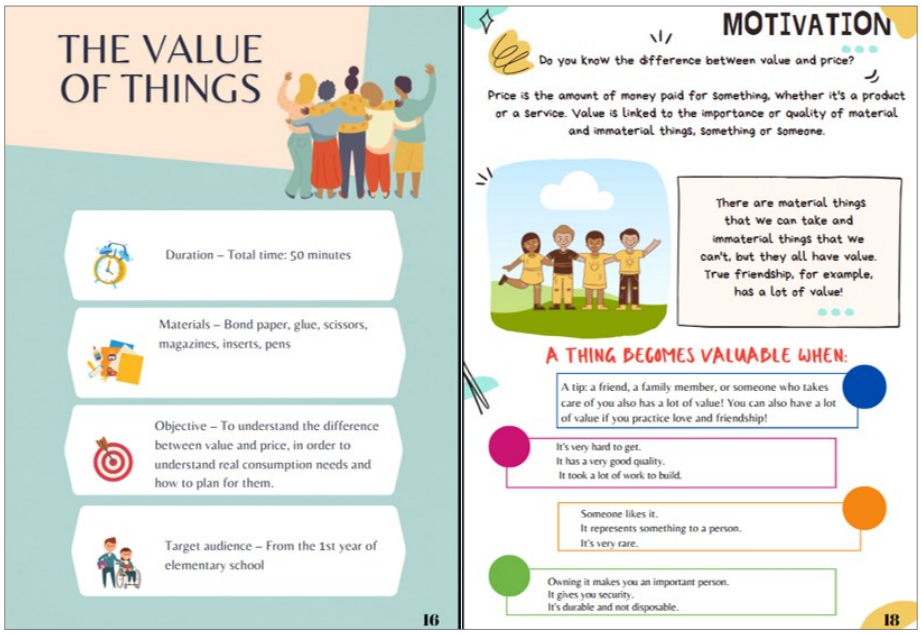
Source: Own elaboration

In the activity proposed by this theme, the students, in groups, trade with each other, simulating the barter practiced at certain times in the history of civilizations. These activities were constructed based on Brousseau's Theory of Didactic Situations (Brousseau, 1996), which includes four phases: in *Formulation*, a problem situation is presented; in the *Action* stage, the students develop their own strategies for solving these problems; in *Validation*, these constructions are shared with the class; and in *Institutionalization*, the teacher/researcher transposes the content constructed into formal knowledge, contextualizing the solution to everyday practices.

So, at the end of the activity, the researchers tried to reflect with the class on everyone's participation, the planning, the facilities, and the difficulties encountered during the activity. In addition, they discussed how we can think about our daily practices based on the activity carried out, for example, how to plan supermarket shopping.

The second activity, entitled *The Value of Things*, is designed to be completed in 50 minutes and requires extra materials, such as magazines and bond paper. Each group is given a blank poster and must identify pictures in the magazines that represent both things that money buys and things that money can't buy. The activity aims to enable a dialog about the difference between value and price. Figure 2 shows the part of the Guide that refers to the theme *The value of things*.

Figure 2: Illustration of part of the Guide (didactic instructional material) related to the theme *The value of things*

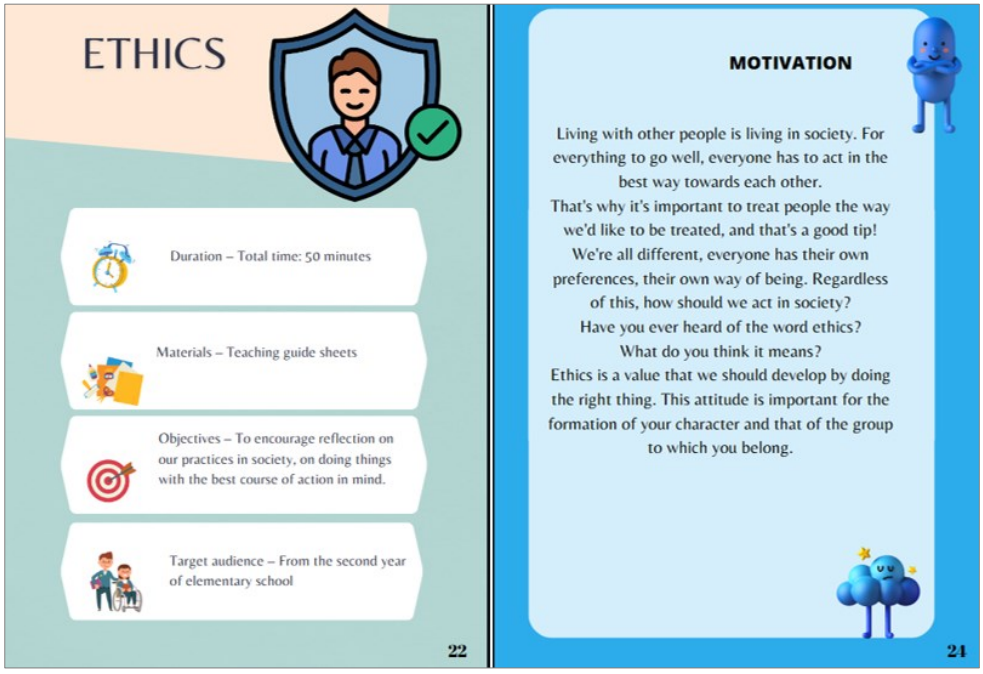


Source: Own elaboration

The Guide's validation and Institutionalization part relates to the theme of *The value of things*. Discussions were suggested on how to acquire those material goods in the future and what consequences an unplanned purchase can have.

The third activity, which will last 50 minutes, deals with ethics. Its aim is to encourage students to reflect on their practices in society and always consider the best way to act. With the class divided into three groups, cards are presented with situations from daily life, and each group must decide which behavior is most appropriate for each situation based on ethics (Figure 3).

Figure 3: Illustration of part of the Guide (didactic instructional material) related to the topic of *ethics*

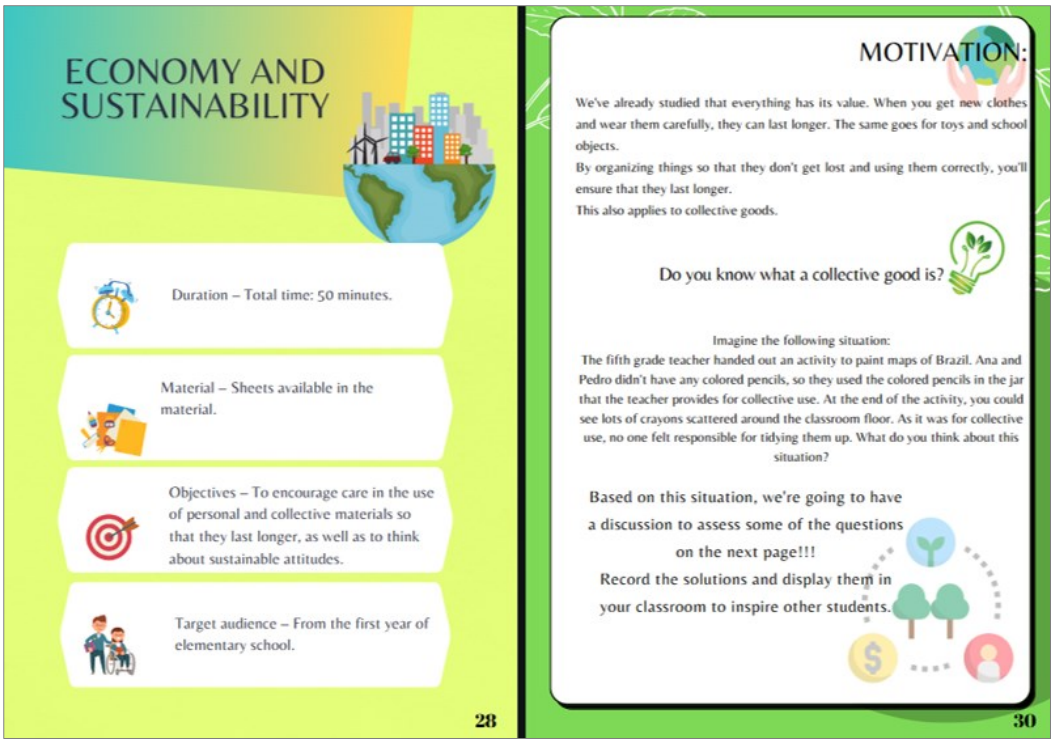


Source: Own elaboration

After some concepts have been presented to the groups, three situations are discussed in which there is a conflict with ethics, represented by actions in children's daily lives, such as finding an object without the owner's name on it; receiving too much change at the store; and creating advantages by receiving duplicate school supplies. As a form of institutionalization, the Guide suggests that the teacher raises questions in relation to personal narratives involving ethical and non-ethical attitudes.

The fourth chapter, Economy and Sustainability, aims to encourage care in the use of personal and collective materials so that they last longer. It takes 50 minutes to complete and presents three situations related to individual and collective materials and natural resources. Each group should discuss solutions to the problems (Figure 4).

Figure 4: Illustration of part of the Guide (didactic instructional material) related to the theme of *Economy and sustainability*

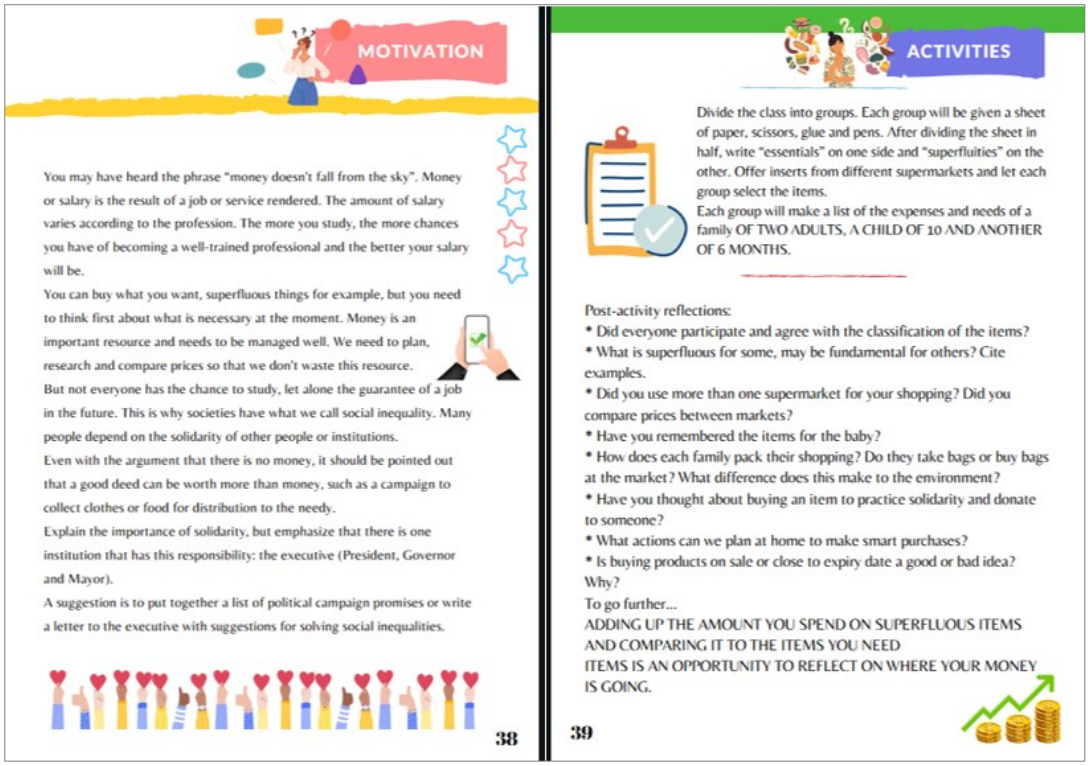


Source: Own elaboration

On the subject of *economy and sustainability*, the Guide presents three situations involving the environment, relating it to the individual behavior of the subjects to be discussed in groups. One of the situations addressed refers to the conscious use of water. As a visual aid, the Guide provides a map of the planisphere so that the teacher can, together with the students, identify which parts correspond to water, including conceptualizing what drinking water is. For institutionalization, the Guide suggests bringing environmental problems to the school community.

The fifth chapter, entitled *Fundamental and Superfluous*, is scheduled to take 50 minutes to complete. It aims to encourage students to reflect on what is necessary and what is superfluous, understanding what the priorities are when making choices for greater well-being. In this activity, the groups research essential items that can be seen as superfluous on the shelves of different supermarkets (Figure 5).

Figure 5: Illustration of part of the Guide (didactic instructional material) related to the theme *Fundamental and superfluous*



Source: Own elaboration

For institutionalization, the Guide presents some topics to be discussed with the groups, such as: price research; prioritizing children's diets; being careful with products on sale; expiration dates and possible substitutions for superfluous items.

From a micro didactic perspective, as described by Almouloud (2010), the variables envisaged indicate that the students must understand the problem data and engage in solving it, using their available knowledge. It is essential that students realize that their old knowledge is not enough to solve the problem immediately. In addition, learning objects provide the tools needed to obtain the solution. The researchers describe, in the micro didactic variables, the possible behaviors that can manifest during the activity's application. This includes the establishment of criteria by the group for carrying out the activities; consensus in defining criteria for things that money buys and things that money doesn't buy; behaviors that seek ethical character; and a sense of collectivity in solving everyday problems. In addition, it promotes the representation of thinking aimed at caring for collective goods, with a view to behavior that is concerned with sustainability.

4 Evaluation and Validation of the Educational Product

In general, we believe teachers should mainly evaluate/validate the Guide (instructional material) since they are the target audience. We therefore tried to use a form to identify weaknesses and strengths that the Guide might have under teachers' criticism, regardless of their area of knowledge. School Financial Education is an interdisciplinary subject that is important for life and training students as critical citizens who are aware of their practices and their relationship with the environment.

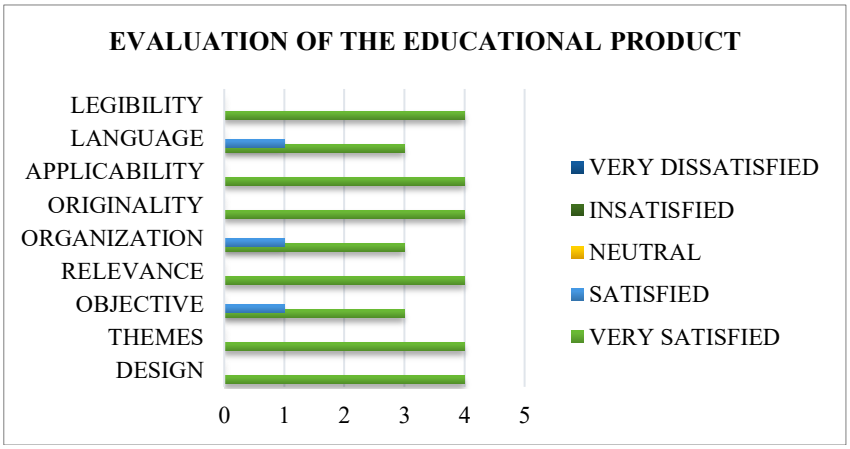
In order to achieve a more thorough evaluation, the researchers chose to use the five axes proposed by Ruiz *et al.* (2014) to organize the Educational Product evaluation and

validation form: attraction; understanding; involvement; acceptance; and change of action, proposed in open questions. The form was also made up of criteria defined by CAPES: design; themes; objectives; relevance; organization; originality; applicability; language and readability, in *Likert* scale format, with the aim of assessing the level of agreement of the evaluators and validators. The form was thus constructed in two parts.

In the first instance, the evaluation was carried out during the 1st Seminar of the *Programa de Pós-graduação no Ensino de Ciências* (Graduate Program in Science Teaching - PROPEC), by the *Grupos de Pesquisa do Instituto Federal de Educação, Ciência e Tecnologia do Rio de Janeiro* (Research Groups of the Federal Institute of Education, Science and Technology of Rio de Janeiro – IFRJ), held in November 2023, in the form of a workshop entitled: *Citizenship, Financial Education and the Classroom: Some Possibilities*. The workshop dealt with school financial education issues for regular school teachers and students on the Mathematics degree course. After the conceptualization, the Educational Product was presented so that those enrolled could handle and evaluate it with the support of the form developed by the researchers.

The evaluation of the Educational Product received four responses, which graded the optional questions between *very satisfied and satisfied*, as shown in Graph 1.

Graph 1: Evaluation of the Educational Product



Source: Research data

In the second part, as these are open questions, we chose to present the record of the validators, which, according to the research, was the Study Group on the Development and Learning of Mathematics in Basic Education (GREDAM), from the Federal University of Pernambuco, under the coordination of Professor Cristiane Azevedo dos Santos Pessoa, whose line of research is School Financial Education. Professor Cristiane Pessoa validated the product and highlighted important themes in Financial Education:

> [...] *I was delighted because it addresses themes that are very dear to Financial Education, but are little (or not at all) addressed in materials that circulate around, such as: solidarity, ethics, desires versus needs, essential versus superfluous items, environmental preservation, caring for the collective, price and value.*

As this is a group whose line of research is School Financial Education, this paper highlights some of the comments made on the validation form, as described in Table 3.

Table 3: Validation of the Educational Product

Questions	Answers
What contributions do you think this product can make?	*For the student, learning about financial education in a playful way and for the teacher, knowledge about the subject and different strategies for teaching in a fun and interesting way.*
What do you think about financial education in the early years?	*I believe that children should be educated financially from the moment they start to consume, starting not only with money itself but with all the resources that require consumption.*
Did you identify any offensive or prejudiced content?	*No, the questions discussed in the game proposals invite students to reflect and collectively build a path to an answer, taking ethical and moral values into account.*
Based on this material, would you rethink the management of your own financial resources?	*Yes, as the notion of what is necessary and superfluous is often forgotten in the routine and we end up spending on totally unnecessary things, this material served as a warning in this sense.*

Source: Research data

Based on the evaluation and validation, the researchers considered the product to be suitable and efficient for its intended purpose.

With the product evaluated, the experimentation stage was carried out. The school has around 600 students from kindergarten to 9th grade. However, the target audience for the research was 2nd and 3rd graders, aged between 7 and 9. All the activities used in the research were applied and analyzed according to Brousseau's Didactic Situation Theory (1996), which is already described in this article.

The meetings took place according to plan, using 50 minutes of school time. With the authorization of those responsible and the Department of Education, with the protocols of the Research Ethics Committee duly completed, the experiment was recorded using audio and image recordings, protecting the identification of the participants.

Once the experiment had been carried out, the researchers proceeded to the last stage of the methodology: *a posteriori* analysis and validation. Concluding Artigue's (1996) Didactic Engineering methodology, the researchers sought to compare the results obtained from the experimental data collection with the variables presented in the a priori analysis. The application of the first proposal of the Teaching Guide, whose title is *Where does the money come from?*, was able to confirm the hypothesis that students enrolled in the Early Years of Primary School are capable of carrying out, with a certain level of organization, exchange activities simulating barter. Of the four groups taking part, one kept its own tokens, restricting the exchange; two groups planned strategies for making exchanges, achieving a balance between the tokens; and one group made exchanges randomly without bothering with planning.

In the proposal *The value of things*, it was possible to observe the distinction that these students already have in relation to the topic of value and price. Of the four groups, two presented a variety of images to conceptualize things that money buys and things that money doesn't buy. The other two groups presented a single image, but with a significant representation of the proposed theme.

Ethics, proposed in the third activity, highlighted that even students in the Early Years of Primary School can opt for ethical attitudes when interacting in society. In this proposal, two groups suggested solving the problem by looking for the object's owner. The other two groups came up with a solution by looking for an adult who could mediate the solution to the problem.

Another proposal challenged the groups to make decisions about receiving too much change. In this activity, the four groups defended the attitude of going back to the shop and returning the overpayment, even pointing out possible consequences, such as firing the employee. This showed the empathy present in the students' character.

The groups took different positions in the proposal in which a student tends to take more school supplies than she is entitled to. One group criticized the student's behavior without proposing another possibility, highlighting the seriousness of the situation. Another group proposed going to the principal and having a real conversation to resolve the situation. The other two groups were concerned about the lack of kits for the other students as a result of the student's inappropriate behavior.

The proposal involving the theme of *economy and sustainability* also brings up reflections on collective goods. In their responses, the students pointed out that school materials should be used more carefully, but they were unable to associate inappropriate use with environmental issues. With regard to collective goods, the participation was not significant, but it was concluded that, once damaged, they would cause problems for many people.

As for the use of water, one student proposed saving rainwater as a solution, which initially astonished the rest of the class. At this point, the researchers introduced new arguments regarding the usefulness of rainwater, listing with the group the ways in which it could be reused, thus awakening a new meaning to the student's suggestion.

The final proposal, entitled *Fundamental and Superfluous, demonstrated that students in the early years of elementary school can discern between what is necessary and what is optional. One group, however, carried out the activity without planning and price research. Two groups did some planning and compared prices between different supermarket inserts. Another group did the activity* but showed little diversity between the images.

5 Main results

In the first activity (*Where does the money come from?*), few groups carried out the exchange in a planned way, with only one group constructing an action strategy. According to the students, we agreed that I would take the money, the other the clothes, and the other the coin. When it came to institutionalizing the activity of planning the supermarket shopping, some students replied:

> *Don't forget to take your card*
>
> *You mustn't forget to take the card, you mustn't forget to take the list*
>
> *You can't forget to take the list if you don't make the list, you might forget and buy what you don't need.*

In this light, we can see that children, when encouraged, are able to reflect on everyday practices involving planning and conscious participation in household chores.

In the activity on *The value of things*, the groups were able to discriminate between material and immaterial goods, opting for pictures that portrayed people playing, walking, listening to stories and relating to friends and family. This shows that they are able to add value to feelings. During institutionalization, the researchers asked what strategies we can use to acquire material goods. Among the answers*, saving money and looking for cheaper prices* show that students can think about planning and budgeting even at a young age. Still, on the topic,

the researchers gave the students the opportunity to share positive moments that they value, such as spending vacations at their grandmother's house or flying kites with their father.

In the activity proposing reflections on ethics, all the groups came up with appropriate solutions to the problems. They pointed out that finding a lost object is something that happens a lot in everyday life and that they always look for the owner or give it to someone responsible at school.

On the subject of *economy and sustainability*, the students mentioned objects that had already been used and received as a form of reuse. At the end of the questions, they were able to grasp the idea that it is necessary to use resources carefully so that they last longer. There was more intense participation in the question about water, so the majority agreed that it needs to be used consciously. One student suggested reusing rainwater as a strategy and although some of his classmates didn't understand and thought it was unreasonable, the researcher's intervention clarified how we can reuse rainwater. Other students suggested other possibilities, such as washing the yard; cleaning the floor; using it in the toilet; and watering the plants.

In the last activity, *fundamental and superfluous*, right at the start of the groups' actions, one student made an important point when he asked whether he could use just one booklet or two different markets in search of the cheapest item. It can be inferred from this that, even without being directly involved in planning the families' actions, the children can see price differences between markets and recognize that this can be a strategy for saving money.

The groups' productions unanimously show that the children are able to identify items that are essential for survival and items that are superfluous. All the groups bought items according to the proposal, which involved buying items for a family with a baby. Products such as wet wipes, diapers, children's shampoo, milk, and yogurt were present in all the projects.

The application provided a lot of learning for both the participants and the researchers, allowing them to observe how students organize themselves to work collectively and solve problems. It confirmed the hypothesis that School Financial Education can be worked on with students aged between 7 and 9 enrolled in the Early Years of Primary School.

Reading the research reveals the students' ability to differentiate between material and immaterial goods, recognize attitudes of value that we can exercise in favor of others, adopt or at least conceptualize ethical attitudes in living together in society, infer consequences for inappropriate behavior, and develop strategies for thinking about the best use of natural resources.

6 Conclusions and implications

In light of this research, it is possible to affirm the hypothesis that School Financial Education associated with Sustainability can be worked on in the Early Years of Primary School and consolidated in the other years of schooling, including new themes. The students showed that they understand the relationship between money and happiness, and that they are serious about their plans for the future when they mentioned professional training as a dream. Although not very expressive, the activity that addressed issues of consumption and the environment made it possible to raise awareness of the relationship between use, waste production and environmental impact.

However, we can see that, in addition to the contributions to conscious education in relation to the use of natural and financial resources, the Educational Product also promotes social responsibility. However, this does not end, much less cover all the ramifications of

School Financial Education. Therefore, the research makes it possible to continue looking for new strategies and themes that can bring reflection on life in a consumer society and sustainability to formal education or regular teaching. It also allows us to expand our reflections to topics such as household budgets; opportunities and risks involving money; consumption traps; salaries; social classes; social inequality; among others.

By developing the activities described in this work, we were able to rethink and revisit our own practices as consumers and people responsible for sustainability. Environmental issues have a direct impact on life on the planet and excessive consumption can lead to a huge amount of material being discarded in nature. In addition, we highlight the contributions that Financial Education can make to the formation of critical and conscious individuals when it comes to making decisions about the appropriate use of financial and natural resources.

Another issue addressed was the difference between material and immaterial goods, which, according to Bauman (2008), has been influencing and distorting values, putting having over being, generating societies in which people are valued by figures. Reflecting on Financial Education beyond interest or discount calculations means rethinking practices that are often motivated by the appeal of the media, which reinforces a desire disguised as a need. Other issues, such as making students aware of social inequalities, can promote the very concept of social class, opportunities, and solidarity.

The conclusion is that working on the *Guia Didático* (Teaching Guide) with classes, especially in public schools, makes a significant contribution to promoting critical thinking in subjects that will be the main cogs in our society in the future.

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