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**SUSTAINABLE FINANCES: A DISCUSSION ABOUT
THE RELATIONS BETWEEN PERSONAL FINANCE
MANAGEMENT AND SUSTAINABILITY**

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**SUSTAINABLE FINANCES: A DISCUSSION ABOUT
THE RELATIONS BETWEEN PERSONAL FINANCE
MANAGEMENT AND SUSTAINABILITY**

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"FINANCIAL EDUCATION: A DISCUSSION ABOUT THE RELATIONS BETWEEN PERSONAL FINANCE MANAGEMENT AND SUSTAINABILITY"

Dissertação apresentada ao Programa de Pós-Graduação em Administração (PPGA-UFCG) como pré-requisito para obtenção do título de Mestre em Administração.

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"Dinheiro é um negócio curioso. Quem não tem está louco para ter, e quem tem está cheio de problemas por causa dele"

(Ayrton Senna)

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Couto, R. F. (2022). **Educação financeira: uma discussão acerca da relação entre a gestão das finanças pessoais e sustentabilidade**. Dissertação de Mestrado em Administração – Universidade Federal de Campina Grande, Paraíba.

Resumo

Este estudo teve como objetivo aprofundar as discussões e análises das relações acerca de educação financeira e sustentabilidade. O primeiro artigo apresenta o mapa bibliométrico clusterizado das discussões científicas entre os campos estudados, apoiado por uma análise de coocorrência de palavras, traz as principais métricas de produtividade e impacto das produções, bem como as concentrações das discussões de educação financeira com a tríplice sustentável. O segundo artigo, apresentamos um framework conceitual e o desenho da relação entre educação financeira e sustentabilidade no comportamento, considerando que os níveis de educação financeira e sustentabilidade impactam diretamente na planejamento e controle orçamentário, nas características de busca por crédito e investimento, bem como nos níveis de poupança e endividamento, nos comportamentos de consumo e na produção e descarte de resíduos, determinando as expectativas e perspectivas de futuro e legado. O terceiro artigo propôs os principais itens envolvidos nas sete dimensões previamente apresentadas no *paper* 2. Foram apresentados um total de 139 itens, validados por especialistas quanto à adequação do item na dimensão e à clareza do enunciado, através de escalas de ordenação. A escolha dos itens se deu pela utilização de escores das médias dos critérios, restando 137 itens ao fim. O trabalho, como um todo, foi um passo para aprofundar a compreensão da relação entre a educação financeira e a sustentabilidade, principalmente no pilar ambiental, pouco investigado e o processo de reunião conceitual e formulação de hipóteses relacionais, bem como a instrumentação, tornam-se valiosas na minimização de riscos e problemas na aplicação prática de pesquisas futuras. Como sugestão para pesquisas futuras, sugere-se a aplicação do instrumento e a utilização das dimensões propostas em estudos que investiguem outras relações, além das propostas.

Palavras-chave: Educação financeira; Alfabetização financeira; Sustentabilidade.

Couto, R. F. (2022). **Financial education: A discussion about the relations between personal finance management and sustainability.** Master Thesis in Management – Federal University of Campina Grande, Paraíba.

Abstract

This study aimed to deepen the discussions and analysis of relationships around financial education and sustainability. The first article presents the clustered bibliometric map of scientific discussions between the fields studied, supported by a co-occurrence analysis of words, bringing the primary metrics of productivity and impact of productions, as well as the concentrations of financial education discussions with the sustainable triple. In the second article, we present a conceptual framework and the design of the relationship between financial education and sustainability in behavior, considering that the levels of financial education and sustainability have a direct impact on budget planning and control, on the characteristics of seeking credit and investment, as well as on the levels of savings and indebtedness, in consumer behavior and the production and disposal of waste, determining expectations and perspectives for the future and legacy. The third article proposed the main items involved in the seven dimensions previously presented in paper 2. A total of 139 items were presented, validated by specialists regarding the adequacy of the item in the dimension and the clarity of the statement, through ordering scales. The choice of items was based on average criteria scores, leaving 137 items at the end. The work, as a whole, was a step towards deepening the understanding of the relationship between financial education and sustainability, especially in the environmental pillar, which little investigated. The process of conceptual gathering and formulation of relational hypotheses and instrumentation becomes valuable in minimizing risks and problems in the practical application of future research. As a suggestion for future research is indicated the application of the instrument and the use of the proposed dimensions in studies that investigate other relationships, in addition to the proposals.

Keywords: Financial education; Financial literacy; Sustainability.

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LIST OF ABBREVIATIONS AND ACRONYMS

OECD	Organization for Economic Cooperation and Development
TBL	Triple Bottom Line

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INTRODUCTION

Given the multidisciplinary and scope of the term sustainability, the conceptual approach most widely accepted by scholars is the ability of current generations to meet their needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development [WCED], 1987). This concept is based on three inseparable pillars, also known as the triple bottom line (TBL), which involves economy, society, and the environment (Elkington, 1994).

Economic and environmental perspectives have always been highlighted on the sustainability tripod because they take opposite positions in the great pendulum of growth/deceleration (Jackson, 2013). On the other hand, the social sphere is not present in the epicenter of the debate (Lehtonen, 2004); this lack of connection between the factors of the TBL ends up generating inefficiency in proposing solutions to contemporary problems.

For this, Gendron (2014) proposed the economic sociology of the environment, emphasizing the self-productive character of society. To spread the idea that it is possible to build a world where the three pillars of sustainability coexist in balance, the support of society is essential. In this way, understanding each of the spheres and bringing the economic and environmental debate closer to the community from a macro (community) and micro (individual) perspective means providing essential knowledge to balance the strengths of the TBL equation. In other words, it is a significant way to turn people into active agents in the search for a better world.

Among the various aspects by which it is possible to work on sustainability with involving the TBL, there is space to discuss financial education. Education, in general, is an essential ingredient for prosperity in its multiple senses. For Oliveira (2010), education has the mission of forming a model citizen who lives searching for the construction of a better society, preserving and perpetuating life on the planet. In this century, financial education gained notoriety, considered a way in which it is possible to solidify economies, reduce social gaps, support the concept of conscious consumption and face a series of other problems; and this for Baumann and Hall (2012), is a pedagogical endeavor.

Following this reasoning, financial education encompasses all activities to develop knowledge, skills, and attitudes in dealing with issues related to money (Lusardi & Mitchell, 2011). According to the Principles and Good Practices of Financial Education and Awareness, financial education is a process in which people apply understanding about financial products, services, and operations that involve personal finance, making more conscious decisions, and

promoting financial well-being (Organization for Economic Cooperation and Development [OECD], 2005).

Currently, financial education is an essential item on the development agenda of all countries and can impact the individual, industrial/market, regulatory and governmental sphere (Organization for Economic Cooperation and Development, [OECD] 2011; Kaiser, *et al.*, 2020). However, it is essential to note that financial education is not restricted to economic factors. Studies show that well-founded financial education bases linked to behavioral intervention culminate in developing and strengthening knowledge, skills, and attitudes that go beyond money management, improving individual and collective life (Hira, 2012; Hamid & Loke, 2020).

The losses of a population that has no financial control range from financial indebtedness and default, which prevents the generation cycle of poverty from breaking and promotes social exclusion, to the development of unrestrained consumption patterns (Kurowski & Laskowska, 2016; Kagotho, 2020; Aleksandrova, *et al.*, 2020). It also contributes to the worsening of problems that include the degradation of natural resources, such as climate change, poverty, hunger, waste generation, diseases, discrimination, among many other destructive effects resulting from the contemporary life model (Siri & Zhu, 2019).

Fostering conciliatory debates on issues that are traditionally treated in isolation in the economic, social and environmental spheres, allows the development of effective solutions to the problems of the contemporary world. Thus, the general concern that motivated this research was: **"What are the relations between financial education and sustainability?"**.

This greater concern produces another question that was a first necessity: **"How are studies in financial education and sustainability being worked in the literature?"**, produced by the need to find out and understand if and how the scientific community has been working these two themes together, the main characteristics of the works, and how the gaps can be addressed.

Identified the gaps, both in productivity and conceptual in the studies of financial education and sustainability, a more in-depth investigation was necessary, according to the following question: **"Which dimensions are involved in the relationship between financial education and sustainability in behavior?"**, which focused on the literary gathering and proposition of a conceptual framework of these dimensions.

Having gathered the main conceptual dimensions that involve the two fields in behavior, the last guiding question was: **"How is it possible to examine these dimensions of**

financial education and sustainability in behavior?”, which culminated in the proposal of a research instrument validated by specialists, which covers the main items belonging to the dimensions, capable of capturing the relationships between financial education and sustainability in behavior.

Discussing financial education from the perspective of sustainability, understanding how these two lines of research can produce symbiosis contributes to the continuous improvement of society, to the advancement of economic arrangements and the balance with the environment; it is an obligation of science in the service for a better world.

1. Objectives

This study aims to develop systematic research to answer the questions previously presented. The general objective is the end of the study, while the specific objectives are the means to achieve the primary goal.

1.1. Main objective

To analyze the relationship between financial education and sustainability.

1.2. Specific objectives

1. Investigate the trajectory of studies in the field of financial education and sustainability through a bibliometric analysis.
2. Propose a conceptual framework designed to investigate the relationship between financial education and sustainability in the behavior.
3. Propose and validate an instrument with the suggestions of the main variables of the relationship between financial education and sustainability in the behavior.

2. Motivation

Faced with a society with multiple possibilities of arrangements, we live in the modern complex social, political, and economic systems that have money as the basis for exchanges (Lévesque, 2009). The role of the primary means of exchange, be it time, work, products, or services, makes it almost impossible to coexist in this system without paper money (Zvaríková & Majerová, 2014). The practicality brought by this physical or digital instrument has allowed it to become the fluid that keeps the vast majority of the world economy irrigated.

So, financial management is how individuals deal with the scarcity or abundance of money-related resources and devise strategies to overcome inherent adversity. Financial literacy, however, is not limited to the ability to understand finance, but a skill for everyday life and for life in a community, whose purposes vary according to the time and space of the individual in society (Bay, Catasús & Johed, 2014).

Given the financialization of social life (Maman & Rosenhek, 2019, 2020), every individual lacks the knowledge to manage money as a resource and learn to deal with its multiple functions and impacts. However, the obviousness of the need does not translate into reality. Many individuals, especially those belonging to the less affluent, end up not having access to essential knowledge to survive.

Managing financial resources in the wrong way can result in social, economic, or even environmental vulnerabilities that can undermine the possibilities of virtuous transformations in society. Panoramas of crises such as that of subprime and Covid-19 expose people's financial fragility due to non-inclusive political, economic, and social scenarios for financial education.

This lethargy removes the individual's role in building the economy, controlling his well-being, and planning his future, a situation that applies to issues related to the environment. The lack of knowledge that allows individuals to understand their role in society and the difficulty of accessing coping tools perpetuates realities where the rich "prosper", and the poor suffer the consequences of that prosperity without even understanding it.

Firstly, this study is justified by the lack of investigations in the literature about the relationship between sustainability and financial education, which may imply the development of other studies and bring new approaches to these fields of research. Second, it can serve as a subsidy for public agents to reflect on their sustainability and financial education policies and entrepreneurs, who can adopt more responsible market strategies for the benefit of society, the environment, and the economy itself. Third, there is hope that this study can contribute in some way to the reduction of social exclusion and inequality; and, lastly, it is an invitation to reflect on our positions as individuals before a planet that pleads for balance.

3. Project structure

The study is structured in the form of three articles, according to **Resolution CPPGA/UFCEG No. 04/2018, Art. 1º.** of the Postgraduate Program in Administration, at the Federal University of Campina Grande. Table 1 shows the summary structure of this work.

Table 1

Research mooring matrix (Adapted from Mazzon, 1981)

Research problem: How has financial education and sustainability been worked on in scientific studies and through which aspects does this relationship occur in the context of personal behavior?

Main objective: To analyze how financial education and sustainability have been worked on in scientific studies, as well as their relationships in individual behavior.

Specific Objectives	Paper	Data Source
Investigate the trajectory of sustainability studies from the perspective of financial education through a bibliometric analysis.	Analysis of the path of studies in financial education and sustainability.	Bibliographic: Web of Science - Core Collection (WoS)
Propose a conceptual framework designed to investigate the relationship between financial education and sustainability in the behavior.	Financial Education and Sustainability: A conceptual framework.	Bibliographic: Web of Science - Core Collection (WoS)
Propose and validate an instrument with the suggestions of the main variables of the relationship between financial education and sustainability in the behavior.	Sustainable finance: Knowledge, skills and attitudes that can make a difference.	Bibliographic: Web of Science - Core Collection (WoS) and specialists in finances and sustainability.

In addition to the **Introduction**, which contextualizes the scenario in which the scientific fields develop and presents the research problem, the general and specific objectives, as well as the justification for conducting the research, this project presents another 03 subsequent chapters:

- **Chapter 1** - Article 1: Study entitled “Analysis of the path of studies on financial education and sustainability” that investigate through the analysis of productivity, scientific impact, and cluster analysis as the literature has dealt with the fields of financial education and sustainability together;
- **Chapter 2** - Article 2: Study entitled “Financial education and sustainability: a conceptual framework” that proposes a conceptual framework of the dimensions involved in the investigation of the relationship between financial education and sustainability in behavior.;
- **Chapter 3** - Article 3: Study entitled “Sustainable finance: Knowledge, skills and attitudes that can make a difference” consists in proposing and validating an instrument with the suggestions of the main variables of the relationship between financial education and sustainability in the behavior, considering the dimensions presented in paper 2.

Finally, a chapter denominated **Conclusion** will briefly discuss the relationship of each paper, as well as their contributions to the scientific community and the areas of financial education and sustainability.

CHAPTER 1 - FIRST PAPER

ANALYSIS OF THE PATH OF STUDIES ON FINANCIAL EDUCATION AND SUSTAINABILITY.

Abstract

Given the increasing financialization of human life, people need to be increasingly able to manage money as a resource. However, personal finance management transcends economic issues and can be discussed from the sustainability perspective in its three pillars. The field of research in financial education and sustainability is remarkably recent, bringing the need to analyze the research trajectory in the area. This research is a bibliometric analysis of a descriptive character, supported by the software VOSviewer and CitNetExplorer, and explored the course of studies in financial education/literacy and sustainability in terms of productivity by year, authors, periodicals, institutions, notable works, and words -key. The main results found were that since 2011 there had been an exponential growth in publications in the area, with the United States being the country that contributed most to the field. The main research titles are related to the didactics of financial education, and the themes are more related to the social and economic spheres of sustainability. Even when composing one of the search filters in the portfolio, sustainability is still an incipient aspect when working in financial education, especially in the environmental sphere. All of this brings the need for more in-depth research to understand the relationship between personal finance management and sustainability fully.

Keywords: Financial education; Financial literacy; Sustainability, Literature review.

1. Introduction

Do several discussions involve understanding sustainability, the main one being how far our finite resource planet can support unlimited economic growth? (Rockström *et al.*, 2009; Victor, 2010; Jackson, 2013). Given the financial crisis experienced in 2007 (Aleksandrova *et al.*, 2020), nations seek less aggressive economic arrangements that contemplate the balance between an inclusive economy, shared social well-being, and a healthy and sustainable environment (Kallis & Norgaard, 2010).

A financially enlightened population can be one of the factors of transition between the world of the traditional economy and the sustainable economy since citizens with a certain degree of proficiency in personal finance can make better decisions when it comes to planning and consuming decisions, investments, credit taking, retirement, protection, and so on. (Fox, Bartholomae & Lee, 2005; Hira & Loibl, 2005; Kindle, 2010; Cole, Sampson & Zia, 2011; Cull & Whitton, 2011; Bucher-Koenen & Lusardi, 2011).

Countries and institutions linked to the Organization for Economic Cooperation and Development (OECD) have been encouraged to develop strategies to disseminate financial education (Atkinson & Messy, 2011). Studies such as that of Calderón, Cunha & De Giorgi (2013) expose the positive correlation between the acquisition of knowledge about personal finance and the possibility for transforming social realities since most low-income people in developing countries run small businesses. Controversially, the neediest are the least likely to enjoy good financial management benefits, precisely because of the lack of access to information (Phillips, 2001; Haskins, 2001).

Besides, it is relevant to mention that factors such as indebtedness, lack of good planning for retirement, and the future end up exposing citizens even more to social vulnerabilities (Hibbert, Lawrence & Prakash, 2012; Babiarz & Robb, 2014; Jiang & Dunn, 2012) and, consequently, economic and environmental matters. In this sense, taking into account that an individual is responsible for making several financial decisions throughout his life, the impacts of these decisions leave the individual sphere and end up affecting the whole society (Mandell & Klein, 2009).

Thus, the sustainable development model - TBL - can also support financial education since it can interact simultaneously on this tripod. In addition, educational actions must be cultivated throughout the individual's life, as the ability to deal with personal finances can lose the power of correction and application, if not practiced (Fernandes, Lynch & Netemeyer, 2014).

However, research in financial education still faces some conceptual barriers since studies have attracted recent interest, given the significant increase in publications only from the twentieth century. For this reason, there are still gaps about what financial education is, given the lack of consensus in the conceptualization of terms (Huston, 2010), studies with controversial results (Johan, Rowlingson & Appleyard, 2020), and semantics, which end up generating confusion (Bruhn *et al.*, 2016). This whole scenario raises the following question: **"How are studies in financial education and sustainability being worked in the literature?"**.

In the first place, this research is justified by the recent discussions in financial education and sustainability, which bring needs to expand and validate understandings. Second, the conceptual stage of these emerging themes requires further exploration of science. Finally, there is no precedent for productivity analysis associated with cluster techniques in the area, which characterizes innovative research.

This article aims to analyze the trajectory of discussions on sustainability in financial education through hybrid techniques for assessing scientific impact and productivity. In addition, cluster analysis with the software VOSviewer and CitNetExplorer were used to increase the study of the database extracted from the Web of Science in their main collections. The intention, therefore, is not to encompass all knowledge about financial education and sustainability but to understand how these two areas have been exchanging themselves from the scientific community point of view.

2. Literature Review

Education, in general, is considered a fundamental pillar for any individual or society to develop in a healthy and lasting way (Costa & Loureiro, 2013). Within this spectrum, we have financial education, which has been increasingly gaining the attention of nations, which have already directed public policies in this direction since the 1990s (Grinstein-Weiss, Reinertson & Russell, 2015).

Discussions about the role of financial education grew exponentially due to the credit crisis that started in 2007, when the financial decision environment, both from a macro and micro point of view, became much more complex (Fernandes, Lynch & Netemeyer, 2014; Muñoz, 2019).

According to Salter (2016), the need for financial literacy in the contemporary world is fundamental, given the functions of money in the current political, economic, and social systems. For being inserted in a system whose money is the primary basis of exchanges and trust, the individual who carries out countless financial transactions throughout his life, needs to be literate to deal with this element in a decision environment that is becoming more and more complex (Boshara, Gannon, Mandell, Phillips & Sass, 2010).

In general, researchers still have controversial views on the effects of financial education (Leonard, 2008; Adams & Rau, 2011; Collins & O'Rourke, 2010; Hastings, Madrian & Skimmyhorn, 2013; Hira, 2010; Willis, 2011). However, seminal studies such as Bernheim's (1995, 1998) have already pointed to the adverse effects of the lack of financial literacy in people's lives, which has been a consensus in recent researches (Loke, 2017; Belekova & Kalachikova, 2018; Tamir & Davidson, 2019; Pangestu & Karnadi, 2020).

According to the literature, it is not easy to understand the term financial education because several terms usually intersect or are not clearly defined; it is up to the learning projects to establish their objectives. (Huston, 2010; Fernandes, Lynch & Netemeyer, 2014).

For some authors, financial education refers to retirement, investment, management, and use of credit (Hira & Loibl, 2005). For others, it can mean budget, savings, purchases, and real estate investments/financing (Fox, Bartholomae & Lee, 2005; Cordeiro, Costa & Silva, 2018) or even education for insurance (Lin, Bruhn & William, 2019).

Atkinson, McKay, Collard and Kempson, (2007) relate financial literacy to staying informed and making better consumption choices. Others like Yang, Ishtiaq and Anwar (2018); Orbanova and Velichova (2013) relate financial education to the probability of success in ventures, while Lusardi & Mitchell (2011) point to the concept of financial capacity, which is the combination of knowledge, skills, and financial attitudes.

Although it is a field of recent studies, which gained the spotlight after the Recommendation on Principles and Good Practices in Financial Education and Awareness (OECD, 2005), it is possible to show that many issues still have little research. One of them is the relationship between financial education and sustainability. And, when it comes to sustainability, it not only refers to the economic sphere but also social and environmental.

Few records seek to understand this relationship, such as Dickmann, Ruppenthal, Schlickmann and Nagorsky (2018); Helm, Serido, Ahn, Ligon and Shim (2019); Kumar and Prakash (2019). Education for personal finances has a much greater potential than economic expectations; it has the role of developing citizens much more aware of their environment and society, and science must investigate this potential.

3. Methodological Procedures

According to Pare, Trudel, Jaana and Kitsiou (2015), reviewing the literature means visiting the conceptual bases that support the study area in search of clarifications, consensus, divergences, and gaps. Therefore, bibliometric studies are indispensable tools for science to develop, considering that this type of investigation enables visualize how a given field of science is evolving, which authors, papers, newspapers, and institutions are most prominent. Besides that, it is possible to make inferences about the direction of the following research and reveal gaps that encourage new productions (Sakata, Sasaki, Akiyama, & Sawatani, 2013; Koseoglu, 2016).

This work performs a descriptive and bibliometric analysis with evaluative and relational techniques guided by Koseoglu (2016) work. The criteria used to assess productivity include: per year, authors, references, institutions, countries and journals, and an

analysis of the co-occurrence of words; all these involving cluster solutions obtained through the software CitNetExplorer and VOSviewer (Van Eck & Waltman, 2014).

To obtain consistent results, follow the procedures suggested by Paré *et al.* (2016) for literature reviews approaching systematicity and transparency; the processes are represented in Figure 1. Concomitantly, we sought to balance the sequencing rigor with an interactive approach, in which adjustments and new routes were designed to achieve the objectives.

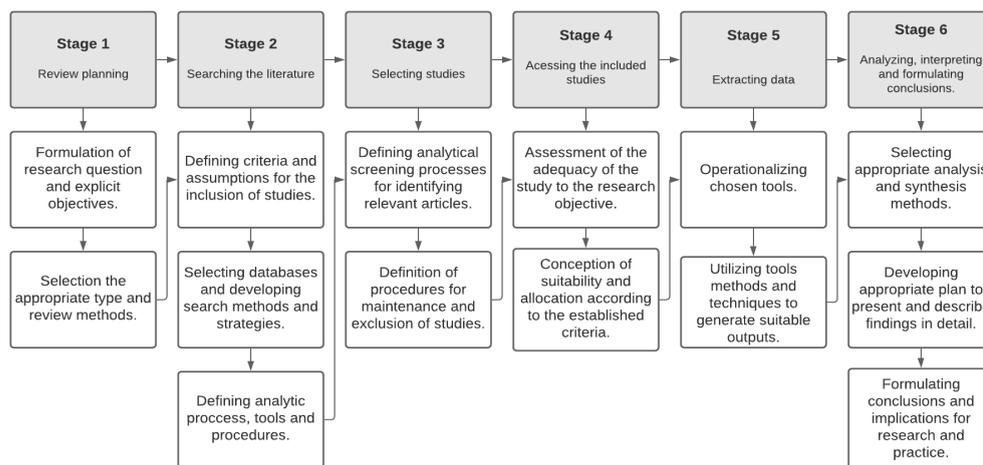


Figure 1. Instantiations of systematicity guidelines in the review process

Source: Adapted from Paré *et al.* (2016).

Stage 1 produced the research question: "How are studies in financial education are being worked on in the literature with sustainability issues?". As well as the general objective, which aimed to answer this central question: "Analyze the trajectory of studies about financial education and sustainability". For that, hybrid evaluation techniques of scientific impact and productivity were used, in addition to clustering analysis.

Stage 2 defined search strategies and criteria, and in stage 3, a database was extracted from the main collections of the Web of Science (WoS) on April 19, 2021. Was used the research topics: financial education; (or) financial literacy; (e) sustainability, and only selected publications classified as 'articles' published between 1945 and 2021 in areas of WoS directly related to the triple bottom line shown in Table 1.

Table 1
Web of Science categories chosen

Area Studies	Ecology	Environmental Studies	Multidisciplinary Sciences
Business Finance	Economics	Family Studies	Social Issues
Business, Sociology	Education Educational Research	Green Sustainable Science Technology	Social Sciences Interdisciplinary
Demography	Education Scientific Disciplines	Humanities Multidisciplinary	Social Work
Development Studies	Environmental Sciences	Management	Urban Studies

After these refinements, a total of 493 articles were obtained, and a pre-analysis was carried out to assess which articles met the research objectives, which characterizes step 4 of the work. All abstracts of papers were read and classified according to the following criteria: 1) Discuss financial education as the main topic; 2) Relate financial education to one or more pillars of sustainability: social, economic, and environmental. Finally, 18 articles were excluded, of which four were not found, making reading impossible, and 14 did not correspond to the study's objective, totaling 475 included studies. All of these criteria reinforce the quality and reliability of the research.

Stage 5 refers to the choice of analysis tools and methods of extraction; the software selected in this study are graphical tools for clustering solutions, CitNetExplorer (www.citnetexplorer.nl) applied to the micro-level analysis and VOSviewer (www.vosviewer.com) applied to macro-level analysis (Van Eck & Waltman 2010, 2014, 2017). The principal resources used in CitNetExplorer are: viewing a network of citations, detailing a network of citations, and searching for publications; while in VOSviewer, they are: analysis of co-authorship, co-occurrence, and citation.

The extraction process was divided into two phases; first, a productivity analysis was carried out, which consisted of identifying the most productive authors, countries, institutions, and the most relevant journals and publications in the portfolio. The second stage was a cluster analysis to determine the quotation networks, research lines, and the word co-occurrence map.

The last stage of the research was developed in the next chapter and presented the results found, bringing some conclusions and implications for the study and practice of financial education for sustainability.

4. Presentation and Interpretation of Results

In this section, the research results are presented, as well as the analyses and interpretations. First, it is crucial to revisit the study's pre-analysis in step 4 of the methods, in which papers were classified with their affinity to sustainability tripod. As shown in Table 2, 297 articles related financial education only to the social pillar through themes linked to education in general, social mobility, quality of life, social vulnerability, skill, behavior, and financial literacy.

In turn, 59 articles related financial education exclusively to the economic pillar, which means that these studies addressed macroeconomic issues such as the role of financial

education in economic development, strategies, and business performance, formulation and conduct of government policies, and their relationship with entrepreneurship. Still, 110 articles cover both the social and the economic spheres simultaneously.

Table 2

Analysis of the discussion of financial education in the spheres of sustainability

Sustainability Sphere	(Q) Articles	(%)
Social	297	62,53%
Economic	59	12,42%
Environmental	0	0,00%
Social and Economic	110	23,16%
Social and Environmental	3	0,63%
Economic and Environmental	3	0,63%
Social, Economic, and Environmental	3	0,63%
	475	100,00%

No evidence was found in the articles to relate financial education exclusively to the environmental sphere of sustainability. However, nine papers addressed the environmental and social pillars (3 publications), environmental and economic (3 publications), and economic, environmental, and social, simultaneously (3 publications). All of this shows that the debates on financial education have been concentrated in the social and economic spheres; in contrast, the environmental pillar is dormant, needing more studies and clarifications, which further reinforces the need for this study.

It is necessary to clarify that in the productivity analysis, the complete counting configuration was used, and was not required to ignore documents with more than 25 collaborations. For the authors' analysis, the author's first name was reduced to the initial letter. In addition, minimum citation values for co-authorship and citation analysis have not been established. There are very recent works that have not yet been cited and would be eliminated from the analysis, not meeting the research objective; Table 3 summarizes the data of this first analysis.

Table 3

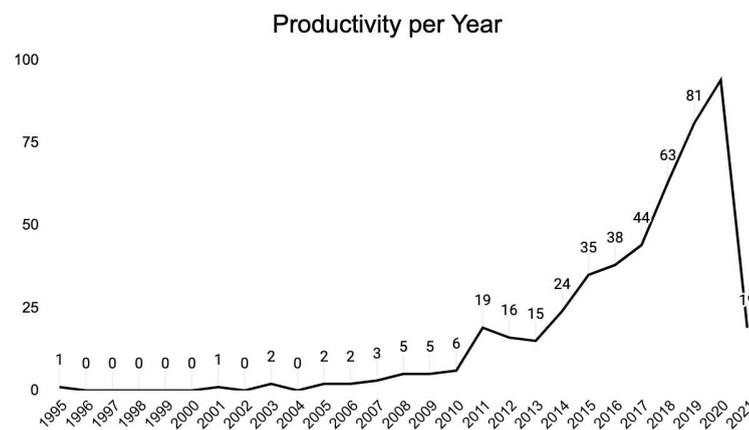
Statistics for the data set of financial education and sustainability publications

N° of publications	475
N° of author	1,080
N° of organizations	583
N° of countries	69
N° of journals	252
N° of cited references	15,909
N° of citation relations in CitNetExplorer	1,065
N° of citation relations between publications in the data set	1,672

From the total of 475 papers included in the study, it was observed that 1,080 authors, established in 583 organizations spread across 69 countries, published in 252 different journals. The network of this database obtained a total internal interaction of 1,672 citation links, and the sum of all external references cited by these works is 15.909. From the historiographical perspective of CitNetExplorer, this database has 1,065 internal citation links.

It is possible to identify in Graphic 1 the growth panorama of scientific production in financial education related to sustainability. It was found that the first study was that of Borokhovich, Bricker, Zivney & Sundaram (1995), entitled "Financial management (1972-1994) - a retrospective", the study was a bibliographic review linked to the economic pillar.

Just six years after the first paper, Tennyson & Nguyen (2001) published the "Curriculum mandates of the state and student knowledge in personal finance." This study is linked to the social pillar and analyzed students' performance in tests of financial literacy and intention of future savings, comparing schools where the discipline of financial education was mandatory and schools where that discipline was not obligatory. Then, the area experienced almost a decade of low productivity, with an average of fewer than three articles published per year between 2002-2010.



Graphic 1. Productivity per year in financial education and sustainability.
Source: Own elaboration.

Only in 2011, there was a substantial increase in publications, making it possible to appoint some inferences to justify this volume. The first is the effects of the credit crisis in 2007, also known as the subprime crisis, which collapsed the world economy, causing all nations to move to formulate national financial education strategies.

The second inference to explain the peak of publications in 2020 is the effects of the economic crisis resulting from Covid-19, which ended up slowing the world economy,

bringing unemployment and decreasing people's income, demanding more knowledge and ability to deal with finances, personal resources, and scarcity of financial resources.

The subsequent analysis is co-authored and examines the area's productivity in three units of analysis: authors, institutions, and countries; Table 4 shows the summary of the ten results for each of these units of study. Of the 1,080 scholars in the database, Xiao stands out for collaborating on 12 articles, followed by Collins, Grinstein-Weiss, and Zia, each collaborating on eight papers; the other authors contribute six or fewer publications.

Table 4
The ten most productive authors, organizations, and countries

Author	Documents	%	Citations	Organization	Documents	%	Citations	Country	Documents	%	Citations
Xiao	12	2,53	340	Washington University	15	3,16	144	United States of America	220	46,32	4426
Grinstein-Weiss	8	1,68	122	University Wisconsin	14	2,95	307	Brazil	26	5,47	67
Zia	8	1,68	280	University of North Carolina	13	2,74	167	People's Republic of China	21	4,42	188
Collins	8	1,68	181	Ohio State University	12	2,53	185	England	20	4,21	336
Serido	6	1,26	81	University Rhode Island	12	2,53	340	Malaysia	19	4,00	65
Loke	6	1,26	19	World Bank	11	2,32	251	Australia	17	3,58	176
Shim	5	1,05	80	University of Georgia	9	1,89	128	Italy	16	3,37	50
Chatterjee	5	1,05	72	University of Missouri	8	1,68	110	Spain	16	3,37	41
Birkenmaier	5	1,05	33	Universiti Sains Malaysia	7	1,47	19	Germany	14	2,95	297
Zhu	5	1,05	0	National Bureau of Economic Research	7	1,47	31	Netherlands	12	2,53	485

When we analyze the number of citations by these authors, Xiao is also the most, with 340 occurrences, and is close to Zia, cited 280 times. Zia has the same number of articles as Collins and Grinstein-Weiss (8 articles), the subsequent most popular authors. On the other hand, Zhu produced five papers but did not obtain citations on the network; one of the causes may be the recent publication of these articles (2019-2020).

Many authors in the field can be positive for developing research, bringing a diversity of debates, and making the soil fertile for developing consistent theories in the future. In this portfolio, of the 1,080 authors, only 170 participate in the most extensive collaboration network, forming 17 clusters, as shown in Figure 2. It is also possible to understand that the prominent authors do not work directly with each other, but their contribution is in the network's nodes.

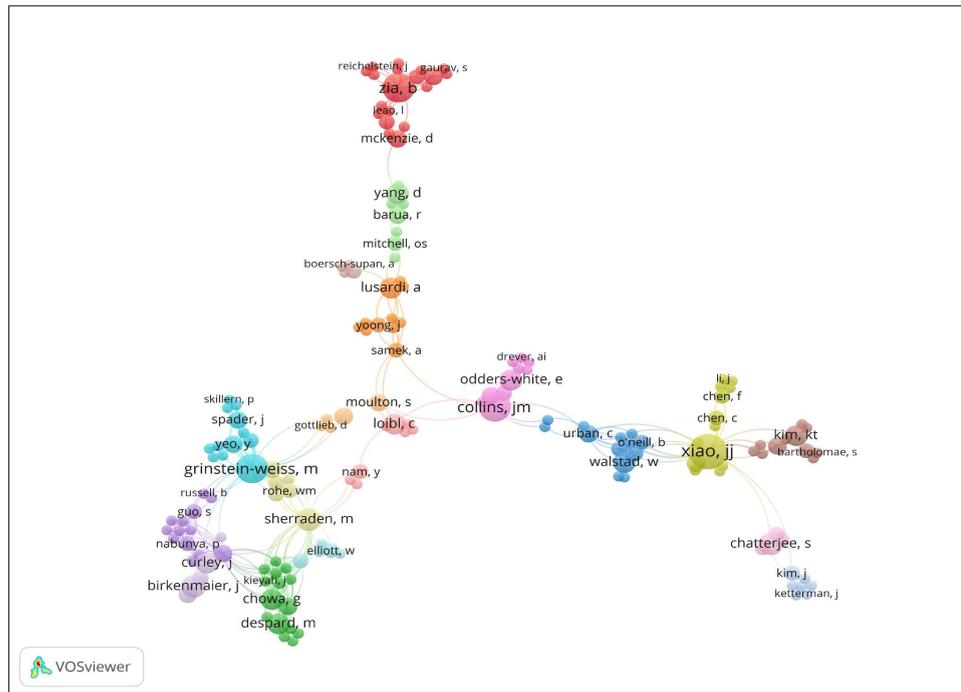


Figure 2. Co-authorship cluster solution - collaboration view by author.
Source: Own elaboration.

Next, the co-authoring analysis on the institutions that most promoted publications in the portfolio of 583 papers, Washington University stood out with 15 articles, followed by the World Bank with 11 papers, and, finally, the University of North Carolina with 13 publications. As in the analysis of most productive authors, there were no identified institutions with a concentration of publications; however, of the ten most influential institutions, nine are from the United States.

When analyzing the number of citations of these institutions, the University of Rhode Island with 340 citations is the most referenced in the network, followed by the University of Wisconsin-Madison with 307 citations and the World Bank with 251 occurrences. In this case, Washington University, although it is the institution that most develops work in the area, is not the most cited.

The last unit of analysis of co-authorship is related to the countries with the highest productivity. From 69 that covered the portfolio, the United States appears with 220 papers, being the country that alone produced almost half of the total publications, corroborating with the previous analysis,

Then, Brazil and China appear with 26 and 21 papers, respectively. Thus, the representativeness of the other countries is not as significant as that of the United States, which, in addition to having the most important number of documents, is most cited in papers, with 4,426 citations. At the same time, Brazil is referenced only 67 times, and China 188.

Other countries, such as England, Germany, and the Netherlands with 20, 14, and 12 papers, have fewer publications but have the highest number of references in the base, with 336, 297, and 485 citations, respectively, behind only the United States.

The productive concentration under siege in the United States can explain many of the characteristics of the research field. Such as the centralization of studies related to sustainability's social and economic pillars and the vacancy of discussion about the environmental pillar. It is also possible to analyze collaboration between countries in publications, as shown in Figure 3. Of the 69, 52 collaborate on the papers; the rest of the publications work in a collaboration bubble.

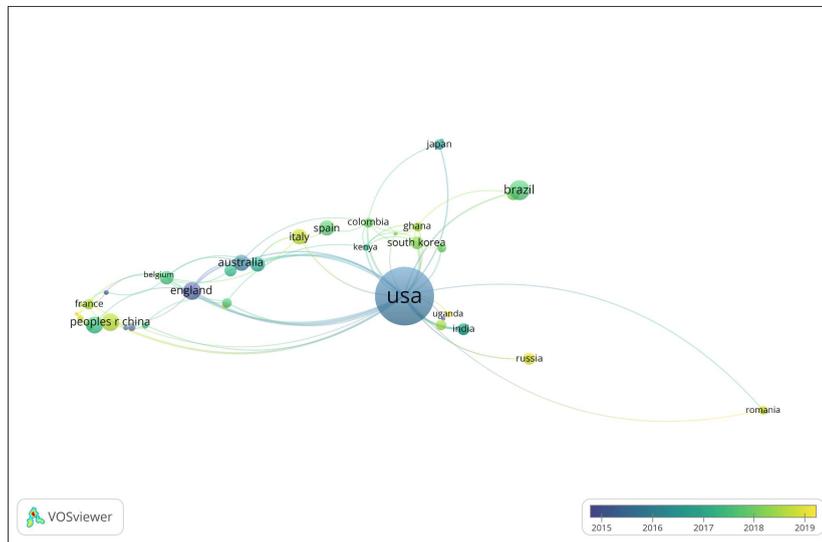


Figure 3. Co-authorship cluster solution - collaboration by countries over the years.
Source: Own elaboration.

The "Overlay Visualization" is used to understand the collaborative relationship between countries and their respective publication densities over the years. The United States is hegemonic in productivity and appears actively collaborating with other countries. Another feature is that United States publications had a slowdown between 2015 and 2017. Other countries such as China, Brazil, Italy, and Russia are more current in the debates, indicating a decentralization of the discussion in the field.

Closing the co-authorship discussion, the analysis of citations is carried out, covering the papers most cited internally in the portfolio and the prominent journals for the area. Of the 475 documents covering this research, 340 were mentioned at least once in the portfolio. Contrasting to the coauthor analysis in the author's view, except Xiao, the authors who produce the most are not those most cited by the network.

As shown in Table 5, the most referenced paper is "Financial literacy, financial education, and downstream financial behaviors" by Fernandes, Lynch & Netemeyer (2014), with 409 citations on the network. That is, 86% of the papers referenced this work. As this is the first meta-analysis in the field, this paper brought some crucial observations for the research and practice of financial education from a didactic and social perspective, becoming one of the milestones of the area.

In sequence, the work of Huston (2010) "Measuring financial literacy" is the second most cited with 364 mentions in the network and was a criticism of the vague definition of the terms that involve financial education contemplating the social pillar of sustainability. Finally, Anderson *et al.* (2013) paper, "Transformative service research: an agenda for the future" with 346 citations, highlighted financial education services as one of those that can transform society, including the environmental pillar.

In addition, it was one of just three studies of this portfolio that managed to relate financial education to the three sustainability tripods simultaneously. The other studies are also highly relevant, as they address financial education in different contexts - Bernheim & Garrett (2003), Cole (2011) and Bucher-koenen & Lusardi (2011) - and even offer counterpoints on their effectiveness for social mobility and economic balance - Willis (2013).

Table 5
The ten most-cited documents

Title	Authors	(Q) Citations
Financial literacy, financial education, and downstream financial behaviors	Fernandes, Lynch & Netemeyer (2014)	409
Measuring financial literacy	Huston (2010)	364
Transformative service research: an agenda for the future	Anderson, Ostrom, Corus, Fisk, Gallan, Giraldo, Mende, Mulder, Rayburn, Rosenbaum, Shirahada & Williams (2013)	346
The effects of financial education in the workplace: evidence from a survey of households	Bernheim & Garrett (2003)	204
Prices or knowledge? What drives demand for financial services in emerging markets?	Cole (2011)	137
Building the case for financial education	Fox & Bartholomae (2005)	135
Financial literacy and retirement planning in Germany	Bucher-koenen & Lusardi (2011)	115
The financial education fallacy	Willis (2011)	104
Consumer financial capability and financial satisfaction	Xiao, Chen & Chen (2014)	98
The effects of financial education on the financial knowledge of high school students	Walstad, Rebeck & MacDonald (2010)	81

The cluster map based on the internal citations of the portfolio had as inclusion criterion the minimum 5% of occurrences in the network; that is, each paper should have at least 24 citations, which resulted in 54 documents, of which only 42 belonged to the network, generating 7 clusters. From the analysis (Figure 4), it is evident that some of the most cited

works end up strongly influencing the network; another important feature is that although the highest productivity in the area occurred in 2020, there is no significant work from 2018 and 2019 mentioned in the portfolio.

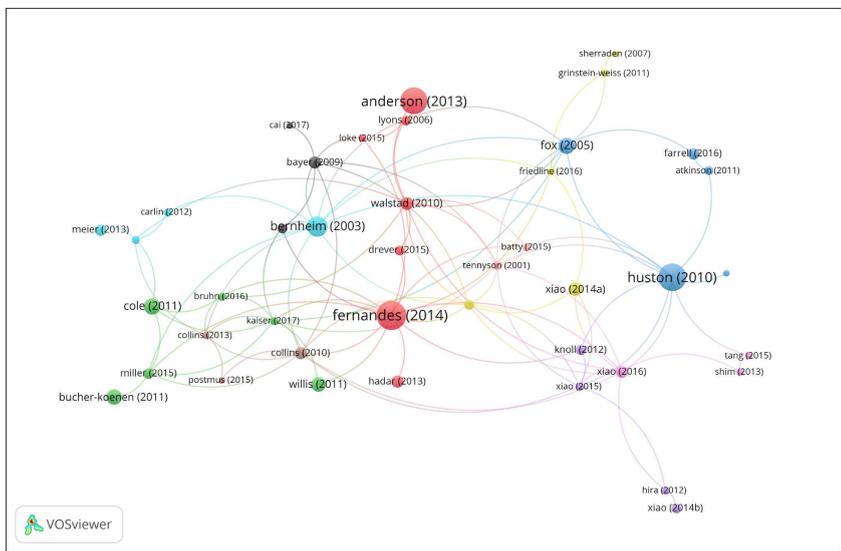


Figure 4. Citation cluster solution - most internal cited documents.
Source: Own elaboration.

Concerning the leading journals, were analyzed the sources that published the most articles in the portfolio. Of 252 journals, the most significant for the area of financial education and sustainability was the Journal of Consumer Affairs (38 publications) and the International Journal of Consumer Studies (17 publications). According to this portfolio, the other sources have few significant indexes (Table 6).

Table 6
The ten most productive sources

Source	(Q) Documents	(%) 475	Citations
Journal of Consumer Affairs	38	8,00%	1,210
International Journal of Consumer Studies	17	3,58%	87
Journal of Family and Economic Issues	11	2,32%	62
Journal of Financial Counseling and Planning	11	2,32%	41
Sustainability	11	2,32%	24
Economic of Education Review	10	2,11%	83
International Journal of Bank Marketing	10	2,11%	59
Children and Youth Services Review	10	2,11%	23
Journal of Extension	8	1,68%	8
Journal of Pension, Economics & Finance	7	1,47%	43

It is worth noting that journals about education and sustainability have published little according to this porfólio. It opens space to infer that financial education has been more related to the act of consuming, and thus, it has been treated much more in conjunction with

the economic and social pillars. This perspective justifies further investigating the relationship between financial education and sustainability, especially in the environmental pillar.

In co-citation analysis, two aspects were investigated: the works most cited by the articles in the portfolio and the authors, making it possible to understand the roots of the field. For an analysis of the authors who most collaborated in the works cited by the portfolio, a total of 11,055 authors were identified, considered the core placed in Table 7.

Table 7
The ten most-cited external authors

Author	Citations	(%) of 11,055
Lusardi, A	723	6,54%
Xiao, J	171	1,55%
OECD	164	1,48%
Bernheim, B	151	1,37%
Mandell, L	108	0,98%
Fernandes, D	101	0,91%
Huston, S	87	0,79%
Collins, J	84	0,76%
Willis, L	80	0,72%
Cole, S	74	0,67%

Lusardi, who appears as the main author of the works mentioned in the portfolio (723 occurrences), and Xiao (171 occurrences), who is also one of the most productive and internally cited authors, is highlighted. The OECD appears with 164 mentions and is one of the main institutions for promoting financial education globally. Except Mandell (108 occurrences), the main authors mentioned externally also appear in previous analyses, confirming their relevance for the area's development.

Regarding the works most referenced by the portfolio, out of a total of 15,909, “The Economic Importance of Financial Literacy: Theory and Evidence” by Lusardi and Mitchell (2014) stands out with 103 citations. The articles by Fernandes *et al.* (2014) and Huston (2010) appear again as external references, reinforcing the importance of the works of these authors.

However, in percentage terms, as shown in Table 8, the most cited authors are present in less than 1% of the works, punctuating the characteristic of a research field still in an embryonic stage, which needs convergence and conceptual consistency to develop.

Table 8
The ten most-cited external references

Author	Title	(Q) Citations	(%) of 15,909
Lusardi & Mitchell (2014)	The Economic Importance of Financial Literacy: Theory and Evidence	103	0,65%

Fernandes, Lynch & Netemeyer (2014)	Financial literacy, financial education, and downstream financial behaviors	98	0,62%
Huston (2010)	Measuring financial literacy	69	0,43%
Lusardi, Mitchell & Curto (2010)	Financial Literacy among the Young	65	0,41%
Bernheim, Garrett & Maki (2001)	Education and saving: The long-term effects of high school financial curriculum mandates	62	0,39%
Hilgert & Hogarth (2003)	Household Financial Management: The Connection between Knowledge and Behavior	61	0,38%
Lusardi & Mitchell (2007)	Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education	54	0,34%
Lusardi & Mitchell (2007)	Baby Boomer retirement security: The roles of planning, financial literacy, and housing wealth	52	0,33%
Hastings, Madrian & Skimmyhorn (2013)	Financial Literacy, Financial Education, and Economic Outcomes	50	0,31%
Bernheim & Garrett (2003)	The effects of financial education in the workplace: evidence from a survey of households	45	0,28%

When adopting the criterion of a minimum of 2 citations per work, the number of papers cited drops to 2.004, confirming the seminality of some papers. For the cluster chart of the most cited external references, shown in Figure 5, the minimum criterion of 10 citations was adopted, and only 126 works met this requirement. In this analysis, it was possible to identify the formation of 3 clusters representing the main lines of research. It explains that although it is a recent field, some seminal works stand out and bring cohesion to the discussions in the area.

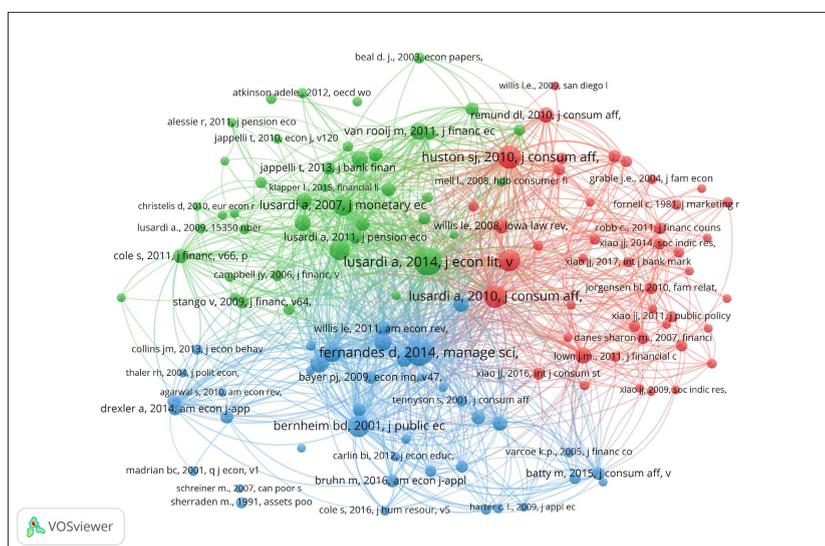


Figure 5. Co-citation cluster solution - most external cited documents.
Source: Own elaboration.

After this productivity analysis, of the nine articles related to the environmental pillar of sustainability and the three that work in total, only Anderson et al. (2013) appear as the third most cited work internally in the portfolio. It corroborates with the proposition that the environmental pillar is still little related to financial education. To comprehend the most relevant themes studied in the area, a co-occurrence analysis of keywords was carried out

based on the textual data. After this, a historiographic cluster analysis brought the main works that work on these themes.

In all, were found 1,670 keywords and 3,609 occurrences were identified in the database. This study used the criterion of at least 15 occurrences, resulting in 22 main words. Among the most cited terms are 'financial literacy' with 235 occurrences, 'financial education' (178 occurrences), and 'education' (72 occurrences). Figure 6 contains the 4 clusters formed by 19 items that indicate the main aspects of research.

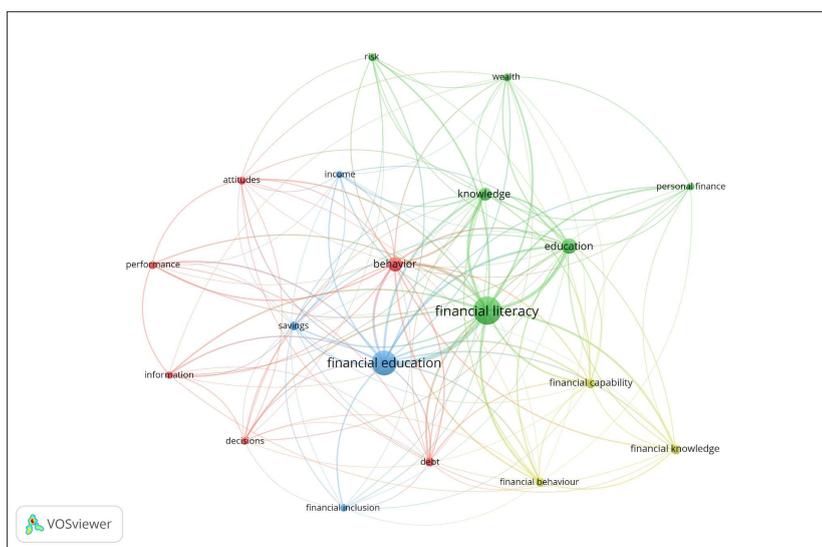


Figure 6. Co-occurrence cluster solution - most used keywords.

Source: Own elaboration.

Note: The following words were excluded from the map: gender-difference, impact, and workplace.

According to Table 9, the red cluster addresses the importance of access to information, linked to behaviors and attitudes towards decisions, especially those related to indebtedness. On the other hand, the green cluster addresses the didactics of financial education from a formal perspective from the perspective of investments and accumulation of financial resources.

In turn, the blue cluster is much more related to the financial inclusion of people without access to the habit of saving and caring for income management. And finally, the yellow cluster addresses the importance of knowledge and skills to develop financial capacity in general. This cluster is also the one that most exchanges with themes from other areas, bringing a more philosophical perspective.

According to this analysis, the research focused on clusters 2 (green) and 3 (blue). It was also found that the word sustainability is not even among the most cited, although it is one of the search filters that generated this database.

Table 9

Summary of clustering solution - most used keywords

Cluster 1 (red) - 6 items	Term	Occurrence	Relevance
Financial Education related to the behavioral lines.	Attitudes	19	0,53%
	Behavior	64	1,77%
	Debt	24	0,67%
	Decisions	16	0,44%
	Information	18	0,50%
	Performance	22	0,61%
Cluster 2 (green) - 6 items	Term	Occurrence	Relevance
Financial Education related to didactic content and formal knowledge	Education	72	2,00%
	Financial literacy	235	6,51%
	Knowledge	53	1,47%
	Personal finance	18	0,50%
	Risk	20	0,55%
	Wealth	20	0,55%
Cluster 3 (blue) - 4 items	Term	Occurrence	Relevance
Financial Education related to practices, planning and savings and investment	Financial education	178	4,93%
	Financial inclusion	15	0,42%
	Income	15	0,42%
	Savings	25	0,69%
Cluster 4 (yellow) - 3 items	Term	Occurrence	Relevance
Financial Education related to a multidisciplinary and philosophical perspective	Financial behavior	26	0,72%
	Financial capability	28	0,78%
	Financial knowledge	28	0,78%

These lines of research are confirmed in the CitNetExplorer clustering solutions using the core publications. The red cluster represented in Figure 7 is the most recent in the field and has a time frame between 2011-2021. The topics it covers are from the behavioral line, analyzing the cultural and behavioral differences that influence the literacy and management of personal finances; much of the research explores the relationship between specific countries or groups and financial education.

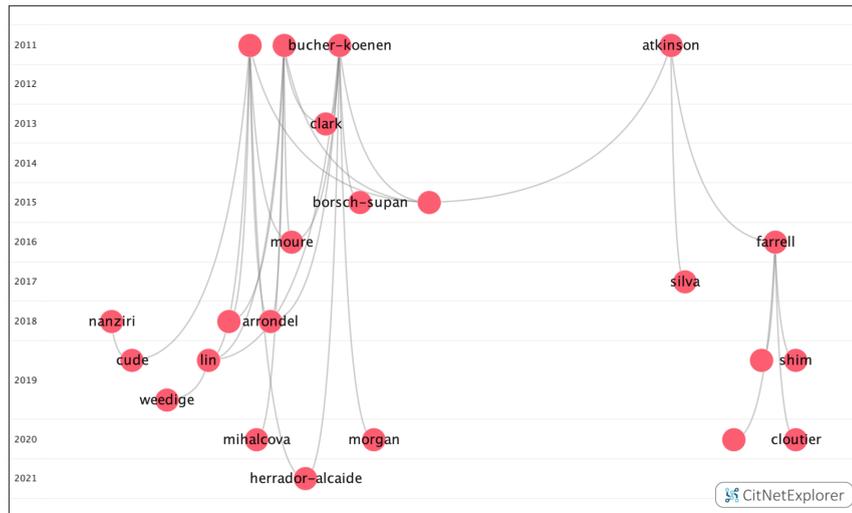


Figure 7. Cluster 1 - Behavioral lines
Source: Own elaboration.

The green cluster, represented by Figure 8, is the most traditional and investigates the didactics of financial education, for example, what makes up financial education and what its role is, what content they should cover, among other issues. It has a time frame between 2001-2021, which confirms that, although it is the oldest line of research, there are still many open questions, such as the lack of consensus in the conceptualization of terms and difficulty in developing solid concepts and theories.

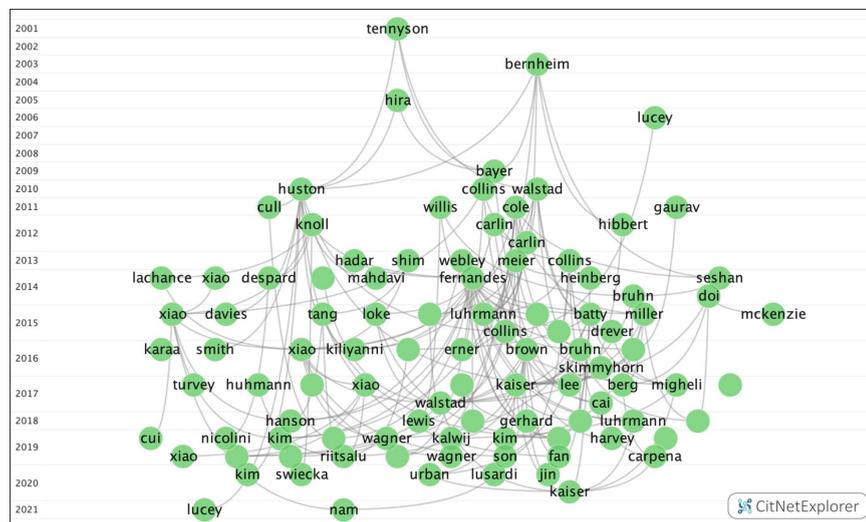


Figure 8. Cluster 2 - Didactic lines
Source: Own elaboration.

The blue cluster shown in Figure 9 is the second most traditional in the field, with a time frame between 2005-2021, and deals with the transition between theory and practice of financial education, based on themes such as financial planning, savings, investment, and credit; pointing to a concern with the economic aspects in social life.

the total authorship of the portfolio. Other countries have a very timid parcel in the field; still, Brazil and China occupy the second and third places in the ranking.

It was confirmed that there are no traditional institutions of study in the area, although the Washington University leads the ranking of publications by institution, with only 15 papers. From the authors perspective, Xiao affiliated with the University of Rhode Island is who most collaborates with the field (12 articles), followed by Grinstein-Weiss, affiliated with Washington University, Zia affiliated with the World Bank, and Collins affiliated with the University of Wisconsin, each collaborating on eight documents. And about the prominent journals in the area are the Journal of Consumer Affairs with 38 papers and the International Journal of Consumer Studies with 17.

The main internal works in the portfolio are those by Fernandes et al. (2014), Huston (2010), and Anderson et al. (2013). According to the papers used in the articles, Lusardi & Mitchell (2014) appears as the main work. Most of the documents in this study address questions related to didactics, consumption of financial products, indebtedness, well-being, entrepreneurship, retirement, savings, and economics. Even though sustainability is one of the words that originated this database, only nine works address the environmental pillar. Of these, only three manage to work financial education in harmony with the triple bottom line.

In the field stand out four general research lines, divided into clusters, confirmed in the analysis of the occurrence of words. Thus, the results of this study point to a still very shallow discussion between financial education and sustainability in the literature, especially about the environmental pillar. All of this leaves many questions open about the role of financial education in developing a society with fewer inequalities, a less aggressive economy, and a healthier environment.

5. Final Remarks

This research sought to capture an overview of discussions in the financial education and sustainability literature, verifying the distribution of articles according to the year, country, author, institution, and journal; all of this to identify the concentration of research in productivity and impact. In addition, a co-occurrence analysis of words was carried out, and the most popular lines of research in the field were identified. Some analyses were reinforced with cluster solutions for greater detail.

We can conclude that studies in financial education and sustainability have gained popularity worldwide since 2011, but the research tradition has focused on the United States.

Brazil and China occupy the second and third places, a timid position, but relevant for decentralizing the theme in countries of economic sovereignty and bringing debates to emerging countries.

Financial education needs more internal consensus to show its development potential in other fields of study. This lack of cohesion for the fundamentals of the area perpetuates research that is very contained in its field. And as it was possible to see in the clustering analysis, the principal authors do not work together directly, and few authors dare to come out of the discussion bubble to relate financial education to other topics.

Then, the researchers must expend much effort in the study of financial education and sustainability, especially about the environmental pillar. Limiting the debate on personal finance management to the economic or social pillar only contributes to perpetuating structures predatory of life and well-being.

The purpose of financial education is not just to empower people to manage money as a resource; that would be equivalent to putting warriors on the front lines of a battle with pocket knives while the opponent has a cannon. The role of financial education focused on sustainability goes further, making up one of the pillars of the formation of citizens and their social and environmental awareness.

The future of studies in financial education and sustainability, far beyond scientific development, also points to developing intelligent solutions to social problems, functioning as a tool to combat inequalities, support healthier economies, and develop a safe and sustainable environment; and this article can be considered as a starting point.

References

Observation: The list of references is at the end of this document.

CHAPTER 2 - SECOND PAPER

FINANCIAL EDUCATION AND SUSTAINABILITY - A CONCEPTUAL FRAMEWORK.

Abstract

This work arises from a literature review involving the fields of financial education and sustainability from 1995 to 2021, which researches are still insufficient and incipient. Being aware of this lack of investigation, this study aims to propose a conceptual framework based on the principles of three-term contingency, exposing the dimensions of intersection, as well as its relations between financial education and sustainability. The research has an exploratory nature and a qualitative description approach. The framework presents as previous elements: knowledge about financial education and sustainability, that influence the result and behavior elements, they are: construction and accompaniment of the personal household budget, the levels of debts, savings, and investments, in the habits of consumption and the waste production and reject, such behaviors lead to the consequence elements, they are: future life quality for the individual, as well as the legacy that will be left for the descendants, the latter being a product that influences and is influenced by the rewards and punishments that the individual can get as a result of his actions. For future research, the validation of the framework is recommended through transversal and longitudinal tools and experiments, enriched by combination or triangulation with other data sources, capable of refusing, confirming, or evolving the propositions of this work.

Keywords: Financial education, Sustainability, Framework.

1. Introduction

Since the outbreak of the term sustainability (World Commission on Environment and Development [WCED], 1987), science and society have searched for ways to conciliate economic growth with sustainable development (Sharachchandra, 1991; Bettencourt *et al.*, 2007; Murray, Skene & Haynes, 2017).

The term sustainability has its origin in the root “sustain” which means supporting, ensuring, and balancing. This same idea is established in the scientific community since sustainability represents the mutual balance between economy, society, and environment, the three pillars of the Triple Bottom Line (TBL) model (WCED, 1987; Elkington, 1994). In this sense, in order to have sustainability, the tripod must be balanced; and, if the level of attention and relevance that are given to each one of them is different, It will result in social problems, economic dysfunctions, and environmental catastrophes, among others (Khandelwal & Darbha, 2021).

Nowadays, It is impossible to refute the centrality assumed by the economic pillar in contemporary times. The greatest evidence of this is that nations and individuals need to adapt

to the monetary tools and pre-established market exchange tools; otherwise, they will be excluded or marginalized from the system (Moro & Hofmann, 2012).

The lack of a critical comprehension of such mechanisms and their impacts contributes to the individuals and nations unintentionally internalize the meanings of economic development, life quality, and even sustainability; generating an imbalance in the TBL equation.

The most disadvantaged strata of society are those closer to the socio-environmental vulnerabilities resulting from economic activity. The lack of knowledge, skills and attitudes to manage the main resource of this system – the money – can be seen as the cause and consequence of this scenario (West & Friedline, 2016). Financial education and literacy can be undertaken as coping devices so that the vulnerable individual assumes a new role in this system, where the management of personal finances is seen as a means of achieving individual well-being and quality of life and, consequently, collective (Anderson et al., 2013).

The exponential growth of the discussions about financial education and sustainability, seem both in the scientific field and in society itself, arises various pertinent questions about these themes. This research concentrates to investigate **“Which dimensions are involved in the relationship between financial education and sustainability in behavior?”**, having as its main goal to develop a framework that enables the growth of the discussions about the theme and makes it better to understand the relationship between financial education and sustainability.

This study is also an invitation to reflect on the exclusion of the teaching and practice of financial education focused on sustainability, in the school environment, family, and society itself. Taking into consideration that one of the social science duties is to contribute to the continuous improvement of life in society, the findings of this work might contribute to the development of pedagogical practices, public policies, actions by the private sector, and other interested public.

2. Literature Review

Education, in general, has an extremely important role in the development of society, as it aims to prepare the individual for adult life. In this sense, the importance of global citizen formation emerges (Davies, Evans & Reid 2005), an individual capable of noticing, reflecting, understanding, criticizing, and acting according to the plural world around them,

being aware of the problems that surround them, whether social, political, economic, environmental, cultural, etc (Campos, Teixeira & Coutinho, 2005; Rosseto et al., 2020).

Financial literacy is considered an essential skill for adult life, given the current social, political, and economic conjuncture of contemporary times (Huston, 2010; Potrich, Vieira, & Kirch, 2015). The importance of this topic has also been recognized by the scientific community, registered in the exponential growth of 96% of scientific production between 1997 and 2020 (López-Medina et al., 2021).

Such interest still does not translate into the solidity of constructs, concepts, and theories, as researchers still diverge or apply ambiguities in the approach of terms and the application of nomenclatures (Hung, Parker & Yoong, 2009). In general, financial literacy is understood as the internalization of financial education, which results in the ability to make better decisions on consumption and personal finance management, understanding financial products, their risks, and opportunities, and aiming for the improvement of financial well-being. (Organization for Economic Co-Operation and Development [OECD], 2013).

The socialization of financial education aligned with sustainability has the potential to imbue the individual with the essential knowledge to coexist in the contemporary capitalist system, without losing the critical ability to question and transform their natural and social environment, for Christensen et al., (1996) would do part of the sustainable development in the absence of a consensus.

As a result, it is possible to maintain the objectives of financial literacy and still enhance sustainability, which is a way of thinking about and exploring the world, meeting the needs, and achieving well-being in the generations nowadays, without affecting the ability of future generations to meet their own needs and achieve their well-being (Elkington, 1994; Becker, 1995; Oliveira Filho, 2004; Zozzoli, 2008).

The works that approach financial education, and sustainability, simultaneously, are still incipient, however, it is possible to perceive the existence of four blocks of predominant perspectives in the research, identified through the co-occurrence of the most used keywords in the works that involve the two fields between 1995 and 2021, presented in **Figure 1**.

The first block approaches the cultural and behavioral elements that influence the practice of financial education; much of the research investigates and compares how certain groups manage their finances and prepare for their future and retirement, given the influences around them (Bucher-Koenen & Lusardi, 2011a; Atkinson & Messy, 2011; Morgan & Trinh, 2020; Herrador-Alcaide, Montserrat & Topa, 2021).

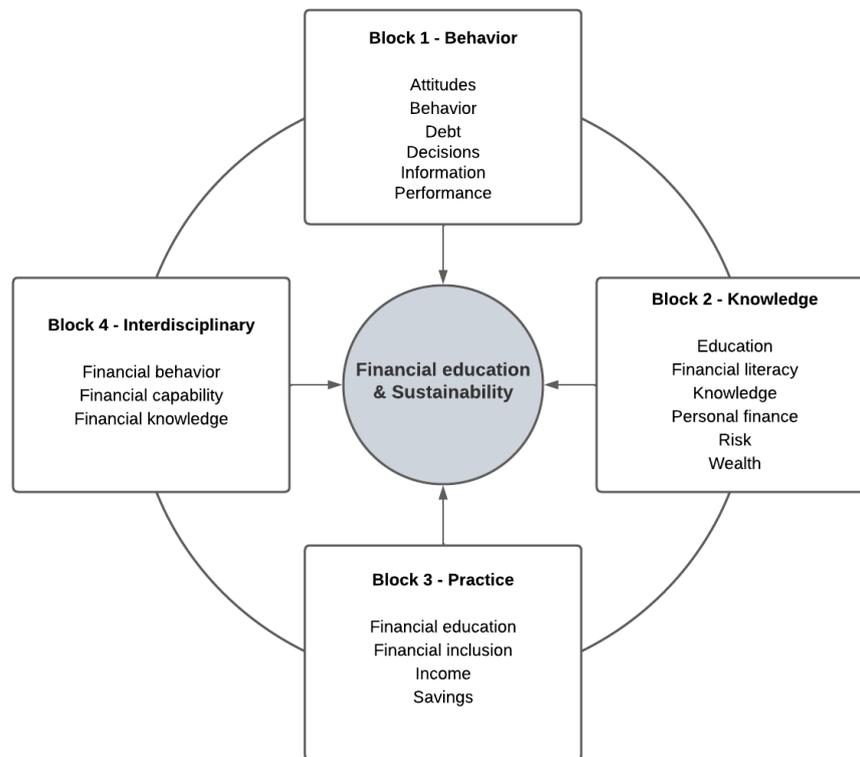


Figure 1. Current position of co-occurrence of words in financial education and sustainability papers (1995-2021).

Source: Own elaboration.

The second block covers issues related to knowledge, content, role, composition, and didactics of financial education; it is, therefore, the oldest research focus with the largest number of publications in the field and aims to answer questions that are still open and fill in conceptual gaps (Tennyson, Sharon & Nguyen, 2005; Huston, 2010; Fernandes, Lynch & Netemeyer, 2014). ; Rebello, Harres & Rocha Filho, 2015; Lucey, White & André; 2020).

The third block is the second most traditional in the field and deals with the transition from theory to practice in financial education, involving topics such as financial planning, savings, investment, credit, and the impact of economic aspects on social life (Fox, Bartholomae & Lee, 2005; Gristein-Weiss, Charles & Curley, 2007; Birkenmaier, Curley & Kelly, 2012. Gristein-Weiss, et al., 2015; Perez, et al., 2021).

Finally, the fourth block is the one with the most lack of research and has been seeking to work on financial education and sustainability in a perspective that is more aligned with the pillars of sustainability - social, economic, and environmental (Lyons, Rachlis & Scherpf, 2007; Brennan & Coppack, 2008; Hira, 2012; Kindle, 2010; 2013; Helm et al., 2019; Anderson et al., 2013; Ianole et al., 2020; López-Medina, 2021).

Even in the last block of research aimed to discuss financial education and sustainability more broadly, there are few records of investigations that involve both fields simultaneously, and even rarer are the works that discuss financial education and literacy and the three pillars of the TBL in a more consistent way, mainly the environmental one. Therefore, it is necessary to investigate which aspects these concepts can be interchanged; This is precisely what this work focuses on.

3. Methodological Proposal

This research stems from a literature review made with the articles that cited the terms financial education and sustainability between the years 1995 to 2021, through which there was verified the scarcity of research involving both fields. Given that all research needs a guiding question (Gil, 2007), the one in this work is: “What are the dimensions that involve the relationship between financial education and sustainability?”. We sought to answer this question by proposing a framework to facilitate the understanding of the proposed problem (Quivy & Campenhoudt, 1995).

This research has an exploratory nature, given the objective of understanding a problem that has been little investigated, about which there are many doubts or that has not been approached previously (Sampieri, Collado & Lucio, 2006). The approach is qualitative since its focus is on deepening the issues discussed (Silveira & Córdova, 2009); as for the objectives, it is characterized as descriptive, since the intention is to make the themes involved familiar (Gil, 2007).

Conceptual frameworks can be narratives or graphic-visual structures that represent key factors, constructs, or variables, and their supposed relationships in a fragment of reality, fact, or phenomenon (Le Moigne, 1977; Miles & Huberman, 1994; Shehabuddeen et al., 1999). This representation is often used in scientific research when there is conceptual complexity, theoretical inconsistency, or lack of community consensus. Therefore, it is adequate for the purpose of this research (Crossan, Lane & White, 1999; Morgon & Morrison, 1999).

The framework's key underlying assumptions were based on the principle of interdependence of the triple contingency of behavior (Skinner, 1953). Thus, given the reservations that the individual's action may or may not occur, environmental factors form the context that precedes the individual's response, and the consequent factors have effects capable of reinforcing, decreasing, or extinguishing the behavior (Skinner, 1969), that is:

$$S_a + R = S_c$$

Where: S_a = Antecedent stimulus,
 R = Response, behavior,
 S_c = Consequent stimulus.

In this sense, given the environmental stimuli and the rewards and punishments resulting from the action, the individual builds his behavioral repertoire (Gomes, et al., 2019). Regarding the development of the framework, it followed the system represented in Figure 2.

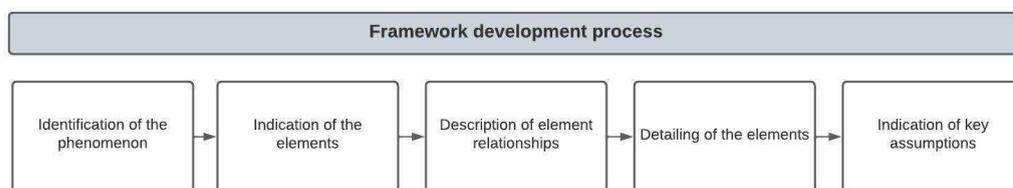


Figure 2. Framework elaboration process
Source: Own elaboration.

First, there was the identification of the phenomenon of interest, then there was the indication of the elements that involve the phenomenon, followed by the description of these elements; later, the key and underlying assumptions were indicated and, finally, the relationships of each of the elements were described. The results of each stage of this research will be described below.

4. Presentation and Interpretation of Results

After identifying the phenomenon of interest - understanding the relationship factors between financial education and sustainability - It is necessary to list the elements of interest in the phenomenon, that is, the dimensions of the framework. Such dimensions come from the most relevant articles in each area; the conceptual framework proposal is shown in Figure 3.

It is proposed that the level of knowledge about financial education and sustainability, the practice of the personal household budget, the level of indebtedness, savings and investments, consumption habits and waste production, as well as the intentions for the future and legacy of individuals, are the intersection dimensions between financial education and sustainability, which will be explored in detail below.

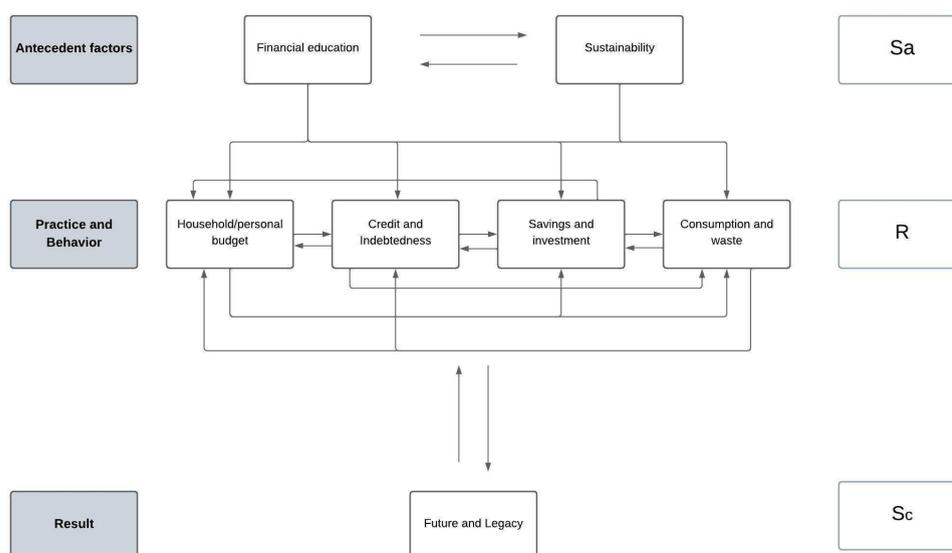


Figure 3. Framework of the dimensions between financial education and sustainability
 Source: Adapt from Adaptado Skinner (1969).

Knowledge of financial education

Financial education is essential for an individual's life, as throughout his life he will be responsible for making several financial decisions and carrying out countless exchanges involving financial resources (Bernheim, Garrett & Maki, 2001; Lusardi & Mitchell, 2007b; Remund, 2010; Hastings, Madrian & Skimmyhorn, 2013). In this sense, obtaining guidance, especially on a family and school bases, is essential to minimize the vulnerabilities caused by financial illiteracy in adult life, not excluding other teaching-learning channels (Lusardi, Mitchell & Curto, 2010; Huston, 2010; Flores, Vieira & Coronel, 2013).

The socialization of financial knowledge, which culminates in financial behavior (Zhu & Chou, 2018) should take into account multiple factors, especially socioeconomic and demographic factors (Lusardi & Mitchell, 2011a; 2014; Atkinson & Messy, 2012; Brown & Graf, 2013). It is also important that the practice of management, as well as the search for knowledge that reinforces the understanding of financial management, is perennial in the individual's life, in order to maintain the knowledge curve and mastery over the subject (Fernandes, Lynch & Netemeyer, 2014).

Therefore, it is necessary the existence of a financial education curriculum that involves: notions of economics - the structure of macroeconomic pillars: monetary, fiscal, and exchange rate, their compositions and main functions, financial mathematics, personal/household budget, types of loans, types of financing (of movable, real estate and services - in particular, the most common types such as car, house, and student loans), credit

card, savings loans, investments, insurance, income tax, and retirement returns. Given that, these are elements with which the individual will interact in adult life or when they obtain autonomy over their finances.

Knowledge of sustainability

From the exploitation of the finite resources of our planet, the economy and society have been developing. However, the ecosystem changes caused by this exploitation sound the alarm for the need to achieve more sustainable ways of living (Dunlap, et al., 2000). Many sustainability scales indicate that, in general, age and level of exposure to environmental issues are factors that interfere in the development of environmental awareness; being the first inversely and the second directly proportional (Dunlap & Van Liere, 2008; Jones & Dunlap, 2010).

For most of those responsible for environmental promotion (Gough & Gough 2010). In this way, the concepts of sustainability should be worked on so that the individual feels that he belongs to a biosphere in which different types of life coexist, and any provocative intervention that may threaten the quality of life, individual and collective, and human existence itself. (Hines, Hungerford & Tomera, 1987; Kollmuss & Agyeman, 2002).

Economy and contemporaneity are facets to which environmental education is irremediably linked (Jickling & Wals, 2008; Hursh, Henderson & Greenwood, 2015). Therefore, it is pertinent that environmental education and sustainability are worked in agreement with financial education, with the aim of positively influencing the behavior and choices of individuals, whether consumption habits, the way of producing and dealing with waste, and the perception of the world around them.

Household/personal budget

The household budget refers to the calculation and monitoring of the income and personal or family expenses, which involve salaries and wages, expenses with food, health, education, clothing, leisure, and other expenses with the acquisition of products and services; all to seek a healthy balance for financial life (Ferreira, 2008; Pereira, 2011). The budget is contained in the tripod of financial education: monetary literacy, price literacy, and budget literacy (Tomášková, Mohelská & Němcová, 2011). And, as it is one of the main tools for financial literacy and the practice of financial management, it will be discussed separately.

Using the budget for personal finance management is the best way to identify times of scarcity or abundance of resources in advance, and thus, make use of available financial instruments more effectively (Lusardi & Mitchell, 2007a; Deaton, 2019; Kurowski, 2021). Given that the home environment is fertile ground for the development of most of the habits of individuals, starting the management of finances through the budget, it is important to consider and involve the home both in the construction and in the monitoring of the budget.

A financial behavior aligned with sustainable habits, through the construction and monitoring of budget planning is capable of providing security and financial well-being for the individual and the family. Consequently, the gain in financial efficiency is also capable of bringing environmental benefits, when it generates savings in natural resources resulting from the decrease in impulse consumption levels, waste production, exposure to vulnerabilities caused by indebtedness, increased conscious consumption, and recycling; among other positive consequences.

Credit and indebtedness

Taking credit is to immediately dispose of resources that you do not have, thus allowing you to anticipate the enjoyment of goods and services, which automatically generates a future obligation of the debtor to the creditor (Marques & Frade, 2003). There are several categories and types of credit offered to consumers, and in this sense, taking out credit is positive for both the development of the economy and people's quality of life (Silva, Silva Neto & Araújo, 2017).

When dealing with consumer credit taking, it is essential to understand and analyze the purpose and value of the credit to be taken, the associated guarantees, the term, the rates charged, the forms and conditions of payment, as well as the ability to pay with what was traded; all these requires extensive research into the conditions available in the market (Levine, 2005; Lusardi & Tufano, 2009; Gathergood, 2012).

Frequently, predatory conditions are intentionally offered to audiences that, for the most part, have not been financially educated or are in a vulnerable position, such as young people, the elderly, and low-income individuals (Hill & Kozup, 2007). When taking credit without prior analysis of the multiple factors that involve it, individuals will be much more likely to fall into over-indebtedness and default, which makes it impossible to transform their individual and collective realities (Stango and Zinman 2009; Agarwal & Mazumder 2013; Gerardi *et al.* 2013; Zinman 2015).

The damage caused by indebtedness and default in the current financial system results in an income deficit intended to meet the needs of the individual and generates increased credit for the related public. These factors can trigger impossibility or difficulty in accessing goods and services that depend directly or indirectly on the financial system - to undertake, rent and finance real estate - hunger and diseases resulting from the difficulty of financially sustaining a healthy diet, psychosomatic diseases; in short, a cascade effect of bigger and more complex problems of a social, economic and also environmental nature.

Savings and investments

In the opposite perspective, surplus management of finance generates what we know as savings; that is when an individual accumulates wealth from the positive differences between his income and expenses. The accumulation of savings can have several purposes, which can range from minimizing future insecurities or for retirement (Cagetti, 2003) to the achievement of a specific objective.

Higher levels of financial literacy lead to greater trends in saving (Cole, Sampson & Zia, 2011; Fun & Zhang, 2021); still, from an economic point of view, savings are a stabilizing factor in the economy (Lusardi & Mitchell, 2011b). However, given their levels of financial literacy, people still save inefficiently (Lusardi, 2000; Kaiser & Menkhoff, 2017), which makes the mission of boosting savings through the act of investing complex.

Investment means the option or opportunity to project and realize a number of financial resources from a smaller amount of resources (Torres & Barros, 2014). There are two types of investments: productive and financial, which share the promise or expectation of remuneration in exchange for risk-taking (Trinh, Morgan & Sonobe, 2020). Briefly, productive investments refer to the decision to open or expand a business; It consists of offering products and services to a consumer public in exchange for remuneration (Nugent & Yhee, 2002). Financial investments, on the other hand, consist of investing investors' latent resources in borrowers' assets or derivatives in exchange, or in the expectation of remuneration; all these are mediated and supervised (Santos & Santos, 2005).

The proficiency and practice of managing financial resources, for the most part, influence the quantity and quality of people's savings, which, in turn, are fertile ground for investment. Accordingly, investors with higher levels of financial education are less likely to use naive strategies in their investments (Hibbert, Lawrence & Prakash, 2012). In this way, the act of investing, on an individual scale, can be considered a way to overcome financial

vulnerabilities (Lyons & Kass-Hanna, 2019; López-Rodríguez & López-Ordoñez, 2022), and on a larger scale, it has the potential to help break the generational cycle of poverty (Moreno-García, Santillán & Gutiérrez-Delgado, 2017).

The expansion of the discussions about financial education and sustainability from the perspective of investments has a great value for the population financially vulnerable, whether when they make the decision to make a productive or financial investment. From the perspective of productive investments, the impacts range from the expectation of better business management, often initiated in informality, to reducing the mortality of companies, to the search for sustainable solutions that impact financial performance, among other possibilities.

From the perspective of financial investments, it can result in an increase in people's savings and equity and consequent dispersion of income concentration, the expansion of the securities market, in the proliferation of fundraising for sustainable companies/initiatives, among other actions that generate, in addition to a consistent return to investors, positive effects for the environment and society.

Consumption and waste

The act of consuming is extremely complex and involves economic, psychological, emotional, and socio-cultural factors, among others (Mancebo *et al.*, 2002; Aquino & Tomassini, 2009). Currently, research on consumer behavior investigates the nuances of consumption, which are much more involved in desires than needs (Belk, Ger & Askegaard, 2003; Charles-Leija, Aboites & Llamas, 2018).

In the contemporary context, in addition to economic and social factors, it is impossible to dissociate consumption from environmental factors, especially when it comes to natural resources used in the production of goods and services, as well as the resulting waste (Grimm *et al.*, 2008; He *et al.*, 2020). One of the greatest challenges today is precisely to find a point of intersection between the interests of profitability of producers of goods and services, consumer satisfaction, and environmental balance (Hira, 2012).

In this way, teaching financially people with the purpose of leveraging the consumption process (Halilovic *et al.*, 2019) is not only inefficient but also harmful to the individual and collective quality of life. Since the management of financial resources and consumption are factors strongly related to economic, social, and environmental factors, it is

essential that financial education and sustainability are directed towards promoting conscious consumption.

This civic form of consumption is an expression of the values of individuals, when they choose to consume, reduce or renounce products and services, taking into account whether their production, distribution, and impacts are aligned, for example, with sustainability, social justice and corporate responsibility (Willis & Schor, 2012; Anderson *et al.*, 2013).

The economic, social, and environmental problems of the current demographic context require changes in the posture of all the players involved - consumers, producers, governments, and institutions. The contribution of sustainable financial education has the potential to increase levels of conscious consumption through purchase planning - prices, deadlines, payment methods, conditions, useful life; all these reduce the potential for indebtedness and the costs of impulse consumption and waste.

In this context, other market players will seek ways to adapt: companies will try to establish a more sustainable connection with their customers, whether through the engineering of their products and services or consumer involvement in their production chain, minimizing prices, among others; Concerning governments and institutions will have to adapt their legislation and their regulation and control processes, so that sustainable entrepreneurship and conscious consumption can be practiced and enhanced, especially about waste.

Future and legacy

The actions that the individual takes in the present depend on what he craves and hopes for in the future, and this premise is also valid for managing finances (Hastings, Madrian & Skimmyhorn, 2013). The way people manage their finances, honor their commitments, and prepare to face the uncertainties of the future is defended as a tool capable of outlining, including, the character attributes of the financial actor (Maman & Rosenhek, 2019).

All around the world, the most emerging economic debate involves the future of individuals' finances and pension systems (Hibbert, Lawrence & Prakash, 2012). Tightening retirement rules are increasingly removing responsibilities for old-age provisions from the state and employers and transferring them to individuals themselves (Bucher-Koenen & Lusardi, 2011; Sekita, 2011). Families with the lowest incomes in the social security system are those with the lowest level of financial literacy, so they are the ones who most need

financial education to face increasingly robust and complex economic systems in old age, and obtaining greater financial security (Berry, Karlan & Pradhan, 2018).

In matters related to finance, as well as those related to the environment, what is practiced today has a direct impact on tomorrow. Therefore, having aligned financial and environmental purposes will provide the individual with a healthy environment to age enjoying tranquility and quality of life, perpetuating a virtuous circle through an example for future generations, and thus, leaving their contribution to posterity.

5. Final Remarks

This research arises from a review of the literature in the fields of financial education and sustainability between the years 1995 to 2021, whose results show that research involving these fields simultaneously is still incipient and scarce. Realizing such a lack of investigation, this study proposed a framework with the elements of the relationship between the two fields. It was understood that the degree of knowledge that an individual has about financial education and sustainability directly impacts the construction and monitoring of their personal household budget.

This, in turn, influences and is influenced by the consumption habits of the individual and the family, which lead to the volume and practices of waste disposal and, consequently, the levels of indebtedness, savings, and investment. This whole panorama culminates in the prospects and quality of life that the individual has for his future, as well as in the construction of his legacy. Given that the economy is a social construction and that discussions involving the environment inevitably lack consideration about the impact of economic activity, there is nothing more pertinent than working on this inseparable tripod through financial education and sustainability.

Financial literacy, by itself, has the role of making the individual perform with much more precision the management of their financial resources, obtaining economic protagonism. Individuals educated with sustainable financial education, in addition to better managing their finances and being an active subject in the economy, will have the ability to perceive, criticize and actively contribute to the society around them. The sensitivity to coexist on a planet of finite resources requires the collective effort of all actors to continue being a stage for human life.

Every effort undertaken here is intended to encourage research, which is still extremely rare, involving the fields of financial education and sustainability, enabling better

approaches to the problems involved. This work is a theoretical proposition, and this is precisely one of its limitations; thus, it is suggested for future research the validation of the framework through instruments and cross-sectional and longitudinal experiments enriched by combination or triangulation with other data sources, capable of refuting, confirming or increasing the propositions of this work.

References

Observation: The list of references is at the end of this document.

CHAPTER 3 - THIRD PAPER

SUSTAINABLE FINANCE - KNOWLEDGE, SKILLS, AND ATTITUDES THAT CAN MAKE A DIFFERENCE.

Abstract

Muitos estudos investigam os benefícios da educação financeira com diversas áreas do comportamento, no entanto, ainda são muito escassos os estudos que envolvem educação financeira e sustentabilidade. Este estudo se concentra em investigar quais os conhecimentos, habilidades e atitudes que envolvem a relação entre esses dois campos no comportamento e tem como objetivo propor e validar um instrumento e sugerir as principais variáveis dessa relação. Esta pesquisa é de caráter qualitativo e de natureza exploratória e descritiva, o tipo de instrumento proposto foi o questionário e a validação de face e conteúdo aconteceu em duas rodadas e foi realizada por onze especialistas, sendo seis da área de sustentabilidade e cinco da área de finanças. O instrumento proposto contou com 139 itens distribuídos em 7 dimensões: educação financeira, sustentabilidade, orçamento, crédito e endividamento, poupança e investimento, consumo e resíduos e futuro e legado. Após a validação, foram mantidas as dimensões e o total de 137 itens. As contribuições deste estudo são: a proposta de escopo das dimensões e a inclusão contundente do pilar ambiental na interação entre educação financeira com o tripé da sustentabilidade. Indicamos o instrumento para experimentos longitudinais, mas ele também se adequa a estudos transversais, e ainda pode ser utilizado como base para formular roteiros de entrevistas e de estudos de caso. A limitação deste estudo foi a concentração teórica, trazendo a necessidade de teste empírico em grupos, o que, certamente, possibilitará o surgimento de novas relações e achados. Como sugestão para estudos futuros, além de indicarmos a aplicação do mesmo, sugerimos o teste parcial ou total das dimensões com outros temas que possam envolver educação financeira, sustentabilidade e consumo.

Keywords: Financial education, Sustainability, Face and content validation.

1. Introduction

From rudimentary commercial transactions to the technological financialization experienced today, it is practically impossible to refute the guiding role of the economy in life in society, equalizing efforts and resources that would otherwise hardly converge. Such centrality also produces dichotomies arising from the premise of economic growth evidenced in the periodic economic crises (Speer, 2013), catastrophes, and environmental crimes (Kahn, 2007; Gibbs *et al.*, 2010; Faroque & South, 2020) and social abysses (Becker, 2013; Martine & Alves, 2015). This scenario brings up reflections about the unsustainable foundations on

which the economy is based, as well as its consequent social and environmental influences and dysfunctions (Penz, 1986).

Currently, the economy and financial markets are practically inseparable and have reached a magnitude capable of dictating economic, environmental, and social directions (Moreno-Casas & Bagus, 2021). Most of the millions of individuals that make up society do not have the knowledge, skills, and access to the tools necessary to coexist in a system exclusively dependent on its workforce and mass consumption (Hayek, 1982).

In this way, the perceptions of the benefits resulting from the increase in the quality of life and the feeling of progress caused by the economic growth of the last seven decades (Lam, 2011) end up overshadowing the reflection of individuals about their contexts and discouraging the debate on the unsustainability of the rhythm economic. Thus, a mistaken concept of sustainability is built into people's ideas, especially in the most socioeconomically vulnerable, that economic development and social and environmental sustainability principles are inversely proportional (Hayek, 1982).

If starting from the economic-financial interest, it is so difficult to consider the tripartite premise of sustainability (Lafferty & Meadowcroft, 2000; Dresner, 2002); nothing more propitious than using social science as a guideline to face the social lethargy that governs thoughts and limits people's actions (Wacquant, 2002). The relevance of aligning these two fields of knowledge is overcoming the instrumental approach of financial education, which does not guarantee anything other than the perpetuation of the current economic arrangement in force (Birochi & Pozzebon, 2016). Furthermore, prove the multiplier factor of financial literacy in the economy, society, and environment (Spaargaren, 2000; Cohen, 2005).

Critical and emancipatory financial education is based on shared values and practices that seek to combat humanitarian and social problems through empowerment, aiming at freedom and quality of life in the individual and collective spheres (Burkett & Sheehan, 2009; Cabraal, 2010). In line with sustainability, these objectives will be complemented and enhanced by the effort to preserve the essential conditions for human existence. The individual with no autonomy to handle their finances and consumption in the current world fails to understand that money, *per se*, cannot guarantee a secure future, much less a prosperous legacy.

Research in financial education and sustainability comes up against conceptual consistency, the lack of exploration of dialogues external to traditional financial education, and the lack of instrumentation. In this way, works committed to trimming these edges

contribute to scientific progress, meeting social, economic, and environmental improvements. This study focuses on the following problem: **"How is it possible to investigate these dimensions of financial education and sustainability in behavior?"** intending to propose and validate an instrument to suggest the main variables of knowledge, skills, and attitudes that involve this relationship. A face and content validation was carried out by eleven specialists, five from financial education and six from the area of sustainability. Given the panorama of investigation in the fields, it is more relevant to advance the conceptual approach and the instrumentation so that future studies have robustness and consistency.

2. Literature review

In educational and scientific research programs, the scope of financial education is defined according to the interests of the promoters or recipients (Huston, 2010), making the definition of topics and their extensions complex and subjective. When the intervention is punctual, the impacts produced are insignificant, with a drop in the learning curve (Fernandes, Lynch & Netemeyer, 2014). For this reason, any financial education program needs to be broad and consistent to promote significant social transformations (Birochi & Pozzebon, 2016).

Many studies have discussed mainly the benefits of financial education and literacy in the budget (Cole, Sampson & Zia, 2011; Ribeiro & Soares, 2016), the level of savings (Fan & Zhang, 2021), in investments (Hastings & Ashton, 2008; Veld-Merkoulova, 2011; Narula, 2022), risk management (Tavares *et al.*, 2020; Zhu & Xiao, 2021), credit acquisition and indebtedness behavior (Scheresberg, 2013; Cude, Chatterjee & Tavosi, 2020), in planning for retirement (Bucher-Koenen & Lusardi, 2011; Mitchell & Lusardi, 2015), in entrepreneurship (Burchi *et al.*, 2021), well-being and happiness (Xiao, Tang & Shim, 2008), in health and exercise (Ono *et al.*, 2021; Yuktadatta, Khan & Kadoya, 2021), in the empowerment of the poor (Mayoux, 2010), in information technology (Birochi & Pozzebon, 2016), in the consumption (Dwyer, 2009), and a multitude of investigations.

The potential of financial education in sustainable behaviors is capable of generating innovative solutions in consumption and credit behavior (Cohen, 2007), in services, especially financial ones (Anderson *et al.*, 2013), to support sustainable actions in micro and small businesses (Rahmandoust *et al.*, 2011; Ye & Kulathunga, 2019), in promoting sustainable economic growth (Bryant, 2013) and in assiduity and increased participation in capital markets (Van Rooij, Lusardi & Alessie, 2011). Another perspective analyzed is the

contribution of financial education to the pressure of consumers on companies to develop innovations capable of improving the environmental performance of their products and services, with the objective of mitigating climate change and environmental damage (Luo & Cheng 2022).

Financial literacy is indispensable for developing managerial skills, which imply achieving goals, not restricted only to the possession of financial resources (Caplinska & Danileviča, 2019). The 2008 economic crisis explains that financial illiteracy promotes and makes it challenging to face crises (Swiecka *et al.*, 2020), generating more social and environmental problems.

Thus, there is a need to investigate the relationship between financial education and sustainability in behavior and its main effects on indebtedness, savings, investments, consumption, production, and waste disposal and, mainly, on future expectations; it is in this perspective that this study focuses.

3. Methodological Proposal

This research aimed to propose and validate an instrument to identify the variables of the relationship between financial education and sustainability in behavior. The type of instrument proposed was the questionnaire, justified by the ability to measure various constructs through aggregated item scores, as well as by its advantages of time, cost, scope, convenience, standardization, anonymity, and minimization of bias in the interview process (Oosterveld, Vorst & Smits, 2019). This study has a qualitative-descriptive character (Gil, 2007; Creswell, 2009) and exploratory nature (Sampieri, Collado & Lucio, 2006), as we understand that conceptual and instrumental advances in the investigated fields strengthen further future statistical deepening.

The experts' face and content validation (Awang, Aji & Osman, 2018) sought to mitigate a possible low quality of data related to the design, adequacy, and writing of the items (Elangovan & Sundaravel, 2021). The study had two validation rounds with 11 participants, 6 of sustainability and 5 of finance. The first round took place between 04/01/2022 and 04/04/2022 and consisted of general consultation, allowing choices in the conceptual and instrumental approach. The second round occurred between 07/04/2022 and 07/07/2022, and the final instrument was proposed to be validated at this stage.

The refinements and reflections made possible by the support of two rounds strengthen the quality and reliability of the instrument and the research itself (Creswell, 2009),

especially about variables, attributes, values, and relationships between variables (Morais, 2005). Two antecedent factors were considered: financial education and sustainability, four behavioral factors: personal/household budget, credit and indebtedness, savings and investment and consumption and waste, and a consequent factor: future and legacy, all proposed in Article 2, as shown in Table 1.

Table 1
Factors, dimensions and objectives of instrument analysis

Factors	Dimensions	Objetivos de análise
Antecedentes	Financial education	Knowledge, understanding and awareness
	Sustainability	Conhecimento, compreensão e consciência
Practice and Behavior	Personal/domestic budget	Knowledge, behaviors and practices
	Credit and indebtedness	Knowledge, behaviors and practices
	Savings and investment	Knowledge, behaviors and practices
	Consumption and waste	Knowledge, behaviors and practices
Consequences/result	Future and legacy	Expectations and assessment of consequences

The specialists evaluated the items through two factors: 1) degree of adequacy of the item to the dimension and 2) clarity of the statement; both used scales (Bermudes *et al.*, 2016). The Likert scale with five ranking points was chosen as it better suits the research objective (Appolinário, 2007), as shown in Table 2.

Table 2
Evaluation of items in the face and content validation

Adequacy of the item on the scale				
1 = Inadequate	2 = Not suitable	3 = Reasonable	4 = Very suitable	5 = Perfect fit
Clarity of statement				
1 = Very bad	2 = Bad	3 = Reasonable	4 = Good	5 = Very good

The cadence and order of the criteria continue to comply with the criteria of quality and reliability (Creswell, 2009). The criteria presented in Table 3 were adopted in decision-making on the item's maintenance, exclusion, and adequacy in the dimensions.

Table 3
Criteria for maintenance, exclusion, or adequacy of the item in the dimension

Average result	Action
< 3	Delete instrument item.
≥ 3 e < 4	Re-evaluate, rewrite and decide to keep or delete the item.
≥ 4	Keep item in the instrument and decide on its adaptation in case of suggestions.

Using consistent criteria brings security and, at the same time, flexibility for the researcher to make research decisions. Once the detailed description of the methodological treatments is finished, the results will be presented and discussed in the following section.

4. Presentation and Interpretation of Results

The discussion will be divided according to dimensions for a better understanding and clarity of the results. The items evaluated in the second round of the survey will be presented with the averages obtained in the criteria of suitability and clarity of the item. After the appreciations and in sequence, the actions adopted will be presented, given the averages, comments, and suggestions, as well as the final result of each item.

Financial education

This dimension aims to identify the levels of awareness, understanding, and knowledge of the fundamentals of financial education and has a total of 18 propositions, presented in Table 4. The studies that supported the constructs of this dimension were: Grable and Joo (1999), Bernheim, Garrett and Maki (2001), Lusardi and Mitchell (2007), Orton (2007), Remund (2010), Atkinson & Messy (2012), Hastings, Madrian and Skimmyhorn (2013), Lusardi, Mitchell and Curto (2010), Huston (2010), Flores, Vieira and Coronel (2013), Zhu and Chou (2018), Lusardi and Mitchell (2011; 2014) Atkinson and Messy (2012) and Brown and Graf (2013).

The following constructs were addressed: understanding of the forms of money (FE1), the inflationary effect (FE2), the validity of currencies (FE4), the veracity of currencies (FE5), the National Financial System (FE6), the exchange rate (FE7 and FE8), means of payment (FE3), taxes (FE10), behavioral finance elements (FE11, FE13, and FE16), analysis of external factors (FE9), trust and learning ability (FE12 and FE15), citizenship (FE14 and FE17) and information security behaviors (FE18).

Table 4
Items proposed in the Financial Education dimension

Initials	Proposed item	Average Adequacy	Average Clarity
FE1	I know that money can take many forms, and each has advantages and disadvantages.	4,36	3,73
FE2	I understand that the purchasing power of money can vary over time.	4,55	4,73
FE3	I understand how most available payment methods work: cash, checks, credit, debit and prepaid cards, vouchers, coupons, pix, and other online payment methods, among others.	4,64	4,64
FE4	I am aware that banknotes and coins can expire or become obsolete over time, and I know how to change them if necessary.	4,82	4,55
FE5	I know how to identify genuine banknotes and coins and what to do if you find counterfeit money.	4,55	4,36
FE6	I know which institutions make up the financial system, the role of each of them, and how to activate institutions and supervisory bodies when necessary.	4,27	4,45
FE7	I know what an exchange rate is and how to apply it to convert values into different currencies.	4,27	4,64

FE8	I understand that exchange rates vary depending on different factors, impacting the prices of many products and services of which I am a regular or potential consumer.	4,45	4,45
FE9	I am aware that political, economic, and environmental issues are capable of interfering with my financial life.	4,82	4,82
FE10	I am aware of the incidence and treatment of taxes applied to rents, rents, borrowing and investment income.	4,55	4,27
FE11	I am aware that the choices I make for my career or investment influence my financial life.	4,45	4,64
FE12	If I do not know a financial subject, I know where I can find the information, and I feel capable of learning.	4,27	4,45
FE13	I am aware that certain financial products suit an individual according to personal/family, social, cultural, ethnic, and religious factors.	4,82	4,64
FE14	I am aware that some essential formal financial products are universal rights.	4,36	3,82
FE15	I feel prepared to evaluate information, manage and make financial decisions.	4,45	4,64
FE16	I am aware that personality traits and emotions can affect investment decisions.	4,64	4,55
FE17	I consider financial literacy essential for adult life and should be mandatory in primary education.	4,82	4,64
FE18	I am careful with my personal information and access passwords, and I check information to avoid scams and fraud.	4,73	4,91

According to Table 4, all the means of the adequacy of the criteria were high, and for this reason, there was no exclusion of items; however, the comments and suggestions of experts were taken into account to improve the writing of all sentences. There was a distribution of item FE10 in the dimensions "credit and indebtedness" and "savings and investment" and the division of items FE4 and FE17 for a better approach, as shown in Table 5.

Table 5
Financial Education dimension after validation

Initials	Result	Action	Reevaluated item
FE1	Six suggestions to the item's restructuring and an example of what "currency" is.	Rewrite	Money can take many tangible and intangible forms (currency, paper money, scriptural money, among others), each of which has advantages and disadvantages.
FE2	Adequacy of the initial verb to avoid response tendencies.	Rewrite	The purchasing power of money can vary over time.
FE3	One suggestion to suppress repeated ideas.	Rewrite	I understand how most available payment methods work: cash, checks, credit, debit and prepaid cards, vouchers, coupons, pix, and other payment methods.
FE4	Three comments about sentence construction and ambiguity in the item.	Split	Banknotes and coins can expire or become obsolete over time. I know how to exchange invalid and obsolete banknotes and coins when necessary.
FE5	Two suggestions regarding the term "genuine".	Rewrite	I know how to identify genuine (real, valid) banknotes and coins and what to do if you find counterfeit money.
FE6	One suggestion regarding the construction of the sentence.	Rewrite	I can identify the public and private institutions that make up the National Financial System, their role, and how to activate them, if necessary.
FE7	One suggestion about the item's relevance in the dimension: however, it is understood that exchange rates are part of the scope of financial education.	Rewrite	I know what exchange rates are and how to apply them to convert values into different currencies.
FE8	One suggestion about the bias of the verb "understand".	Rewrite	Exchange rates vary depending on different factors, impacting the prices of many products and services of which I am a regular or potential consumer.
FE9	Two suggestions about the bias of the terms "I am aware" and the need to add the term "social."	Rewrite	Political, economic, social, and environmental issues can interfere with my financial life.
FE10	Two suggestions on the best suitability of the item in the dimensions "credit and indebtedness" and "savings and investment" separately.	Relocate	
FE11	Two suggestions on the need for greater sentence coverage.	Rewrite	Life decisions, career, personal life, lifestyle, credit, or investment influence financial life.
FE12	Two suggestions on sentence construction.	Rewrite	I know where I can look for financial information and knowledge, and I feel capable of learning.
FE13	Adequacy of the initial expression so as not to cause response tendencies, suggested in previous items.	Rewrite	Certain financial products suit individuals according to personal/family, social, cultural, ethnic, and religious factors.

FE14	Five suggestions about the need for exemplification.	Rewrite	Some formal financial services are universal rights, such as accounts for receiving salaries and wages, access to a debit card, withdrawals and transfers between accounts, statements of movement, and clearing of checks, respecting the limits and rules established in current legislation.
FE15	One suggestion as to the existence of three factors being evaluated in the item.	Rewrite	I feel able to evaluate information and make financial decisions.
FE16	One suggestion about the sentence coverage.	Rewrite	Personality traits and emotions can affect financial decisions, such as borrowing and investing.
FE17	Two suggestions about the existence of two factors being evaluated in the item and regarding the term "adult life."	Split	Financial literacy is essential for life. Financial education should be offered on a mandatory basis in primary education.
FE18	Two suggestions regarding sentence construction.	Rewrite	I protect my personal information and access passwords, and check information to avoid being a victim of fraud and financial scams.

This dimension increased from 18 to 19 items, which enabled better performance in capturing familiarity with financial education concepts to understand the individual's position in the economy; it is essential to understand the fundamentals of currency, its validity and veracity, the exercise of citizenship that involves knowledge of the National Financial System and its institutions, the concepts of exchange, taxes, inflation and the multiple means payment, behavioral elements in decisions, impact of external factors, trust, ability to learn and behaviors to protect sensitive information.

It is intended to confirm whether the level of knowledge in financial education positively affects budget control, habits and knowledge of credit, indebtedness, savings, investment, and consumption, and to what extent they can influence expectations for the future and legacy. It is also intended to verify what kind of relationship exists between the knowledge of financial education and the sustainability dimension and the production and disposal of waste, which is not yet verified in the literature.

Sustainability

This dimension aims to identify levels of awareness, understanding, and knowledge about concepts of environmental education and sustainability. It had a total of 16 propositions, presented in Table 6. The studies used in the construction of this dimension were: Hines, Hungerford, and Tomera (1987), Dunlap *et al.* (2000), Kollmuss and Agyeman (2002), Dunlap and Van Liere (2008), Jickling and Wals (2008), Jones and Dunlap (2010), Gough and Gough (2010) and Hursh, Henderson and Greenwood (2015).

The following constructs were addressed: perception of environmental balance (S1), the influence of behavior on natural resources (S2), understanding of biodiversity (S3), distribution of water (S4) and food (S5), level of knowledge about the National Environment System (S6, S7, and S8), deforestation (S9), the importance of native populations (S10), sustainable behavior (S11), perception of social vulnerability (S12) and sustainable economy (S13, S14, and S15) perception of citizenship in sustainability (S16).

Table 6
Items proposed in the Sustainability dimension

Initials	Proposed item	Average Adequacy	Average Clarity
S1	I understand that a balanced environment is an indispensable factor for the perpetuation of human life.	4,64	4,55
S2	I understand that consumption impacts the need for high energy levels and raw materials, which can cause the depletion of natural resources.	4,55	4,73
S3	Man needs to respect and coexist in biodiversity, as he is just another form of life among the others.	4,55	4,55
S4	I believe that water distribution, availability, and quality depend on the collective effort between public, private, and civil society.	4,73	4,64
S5	Currently, we have the best methods, techniques, and food distribution channels, so there is no waste.	4,27	4,45
S6	I know which institutions and bodies make up the National Environment System and the function of each one.	4,73	4,73
S7	I believe that the institutions and bodies responsible for environmental crimes are prepared and have the necessary resources to carry out their work in the best possible way.	4,27	4,64
S8	I know whom to turn to and how to report a suspected or environmental crime.	4,64	4,64
S9	I am aware that deforestation promotes harm, such as destruction of biodiversity, erosion, soil impoverishment, desertification, rising temperatures, floods, and silting of rivers.	4,55	4,82
S10	I believe that indigenous populations contribute to environmental preservation.	4,55	4,45
S11	I believe that individual sustainable habits and actions can promote large-scale changes.	4,45	4,55
S12	I believe that socially vulnerable people are more exposed to precarious environmental conditions.	4,82	4,64
S13	I believe that it is possible to develop an economy that respects natural limits and manages to promote social well-being.	4,82	4,64
S14	It is possible to generate employment and income through environmental preservation, such as ecotourism.	4,55	4,27
S15	Sustainable institutions increase the wealth of society.	4,36	4,18
S16	I consider environmental education and education for sustainability essential for adult life and should be offered as a mandatory part of primary education.	4,64	4,55

As shown in Table 6, all the means of the adequacy of the criteria were high, and for this reason, there was no exclusion of items, but there was a division of item S16, as it was understood that it measured two different factors. With the exception of items S3, S5, and S8, the others were rewritten according to the suggestions, as shown in Table 7.

Table 7
Sustainability dimension after validation

Initials	Result	Action	Reevaluated item
S1	Adequacy of the initial verb so as not to cause response tendencies, suggested in previous items.	Rewrite	A healthy and balanced environment is an indispensable factor for the perpetuation of human life.
S2	Adequacy of the initial verb so as not to cause response tendencies, suggested in previous items.	Rewrite	The act of consuming, in general, influences the need for energy and raw materials, which can cause the depletion of natural resources.
S3	One suggestion that S3 evaluates the same as S1. Suggestion not accepted, as this item evaluates "biodiversity".	Maintain	Man needs to respect and coexist in biodiversity, as he is just another form of life among the others.
S4	One suggestion regarding the verb "I believe".	Rewrite	The distribution, availability, and quality of water depend on the collective effort between public, private, and civil society.
S5	Relevant averages and no comments.	Maintain	Currently, we have the best methods, techniques, and food distribution channels, so there is no waste.
S6	Adequacy to the sentence construction standards mentioned in previous items.	Rewrite	I can identify institutions that make up the National Environment System, the function of each of them, and how to activate them, if necessary.
S7	Adequacy to the sentence construction standards mentioned in previous items.	Rewrite	The institutions and bodies responsible for investigating and punishing environmental crimes are prepared and have the necessary resources to carry out their work in the best possible way.
S8	Relevant averages and no comments.	Maintain	I know whom to turn to and how to report a suspected or environmental crime.
S9	One suggestion is that the item measures the same as S1 and S3. Suggestion not accepted since the item evaluates "deforestation." Adequacy to the sentence construction standards mentioned in previous items.	Rewrite	Deforestation promotes harm, such as destruction of biodiversity, erosion, soil impoverishment, desertification, rising temperatures, floods, and silting of rivers.
S10	One suggestion regarding the verb "I believe" and another stating that the item is out of	Rewrite	Native populations contribute to environmental preservation.

S11	context. It was decided to change from "indigenous" to "native." One comment to insert the term "collectives" and adequacy of the initial verb to not cause response tendencies, suggested in previous items.	Rewrite	Individual sustainable habits and actions are capable of promoting collective and large-scale changes.
S12	One accepted suggestion to change the expression "precarious environmental conditions" for "environmental risks" and adequacy of the initial verb to not cause response tendencies was suggested in previous items.	Rewrite	Socially vulnerable people are more exposed to environmental risks.
S13	Adequacy of the initial verb so as not to cause response tendencies, suggested in previous items.	Rewrite	It is possible to develop an economy that respects natural limits and manages to promote social well-being.
S14	Five comments on the term "ecotourism". We opted for the removal of the term to give generalization to the item.	Rewrite	It is possible to generate employment and income through environmental preservation initiatives.
S15	Three comments on the term "institutions" and "wealth". It was decided to specify the first term and replace the second.	Rewrite	Sustainable institutions, public and private, increase the well-being of society.
S16	Three suggestions about the existence of two factors being evaluated in the item. The same action adopted in item FE17 was followed.	Split	Environmental education and education for sustainability are essential for life. Environmental education should be addressed consistently in basic education.

This dimension increased from 16 to 17 items, improving the ability to access knowledge about environmental education and sustainability, which is due to previous exposure and awareness of the importance of environmental balance, natural resources, including biodiversity and water, a critical view of food distribution, of certain levels of knowledge about the National Environment System, the harm caused by deforestation, the role of native populations, the feasibility of a sustainable economy, the level of citizenship involved in sustainability, the perception of social vulnerabilities arising from unbalanced environmental factors and from the citizenship involved in sustainable behavior.

It is intended to confirm whether the level of knowledge of environmental education and sustainability interfere with consumption and in the production and disposal of waste, as well as in the expectations of the future and legacy. It is intended to verify what kind of relationship exists between the level of knowledge in environmental education and sustainability with the dimensions of financial education, budget, credit and indebtedness, and savings and investments.

Household/personal Budget

This dimension aims to identify the knowledge and practices about the personal/domestic budget and had a total of 22 propositions, presented in Table 8. For the proposition of the items, the following literature was used: Lusardi and Mitchell (2007), Ferreira (2008), Pereira (2011), Tomášková, Mohelská and Němcová (2011), Ribeiro and Soares (2016), Deaton (2019) and Kurowski (2021).

The following constructs were addressed: knowledge, planning, and control of income and income (B1, B2, B3, and B4), knowledge, planning, and control of income and variable income (B5), perception of income in the standard of living (B6), knowledge, planning, and control of expenses (B7, B8, B9, and B10), knowledge, planning, and control of fixed and variable expenses (B11), perception of expenses in the standard of living (B12), transaction cost practices (B13), use of budgeting methods and tools (B14), sharing ability (B15), analytical and decision-making ability (B17, B18, B19, and B22) and budget control (B16, B20, and B21).

Table 8

Items proposed in the Household/personal budget dimension

Initials	Proposed item	Average Adequacy	Average Clarity
B1	I understand that income is the money that goes into the budget (salaries and wages, rents, leases, income, among others).	4,78	4,78
B2	I carry out realistic planning of future income	4,78	4,78
B3	Record and compare budgeted <i>versus</i> realized revenues.	4,78	4,78
B4	I look for ways to earn enough income to meet the period's expenses.	4,78	4,44
B5	I am aware that an individual's net income may fluctuate over time.	4,67	4,33
B6	I understand that it is necessary to earn enough income to achieve the standard of living I desire now and in the future.	4,67	4,56
B7	I understand that expenses are the outflows of money from the budget (spending on health, education, housing, food, leisure, taxes, and other financial obligations to be fulfilled).	4,78	4,78
B8	I carry out realistic planning of future expenses.	4,56	4,78
B9	Record and compare budgeted <i>versus</i> actual expenses.	4,78	4,78
B10	I look for ways to adjust my expenses to the period's income.	4,67	4,56
B11	I consider fixed and variable expenses and try to minimize the impacts of unexpected expenses.	4,50	4,75
B12	I understand that it is necessary to spend intelligently and consciously to enjoy the standard of living that I want in the present and future.	4,44	4,67
B13	I consider the financial transaction costs of each payment method before using them.	4,67	4,67
B14	I use appropriate methods to manage personal/home finances.	4,44	3,88
B15	I feel comfortable discussing household budgeting with others when necessary.	4,22	4,44
B16	I know the importance of recording, filing, and tracking financial facts to build healthy financial habits.	4,67	4,67
B17	I calculate, interpret and compare prices, products, and suppliers before making decisions.	4,78	4,78
B18	I understand that my personal decisions and life choices influence the financial conditions and quality of life I will have in the future.	2,91	4,82
B19	I set priorities, cut expenses, and change and adjust my financial plans when necessary.	4,63	4,75
B20	I check if mistakes were made when making payments and purchases, which can hurt my budget.	4,56	4,78
B21	I periodically reassess the adequacy of the financial products held.	4,56	4,44
B22	I consider my budgetary conditions and capabilities before making decisions.	4,78	4,67

According to Table 8, the worst average for the adequacy criterion was B18 (2.91); the average value and the similarity with the EF11 resulted in the exclusion of the item in this dimension; as for the clarity of statement criterion, the worst average was for item B14 with 3.88, which implied the restructuring of the item. Also, B5 was divided into two sentences to cover the concepts of gross income and net income; for the others, the comments were taken into account, except for items B2, B8, B15, B19, and B20, which remained as brought in Table 9.

Table 9

Household/personal Budget dimension after validation

Initials	Result	Action	Reevaluated item
B1	Relevant averages and no comments.	Maintain	I understand that income is the money that goes into the budget

B2	Relevant averages and no comments. One comment suggests specifying	Maintain	(salaries and wages, rents, leases, income, among others). I carry out realistic planning of future income.
B3	"budgeted revenues" and "actualized revenues".	Rewrite	Record and compare budgeted (planned) <i>versus</i> actual (that have already happened or are happening) revenues.
B4	Two suggestions for specifying "period". Three suggestions for replacing the terms "float", "according to the period," and "income". Adequacy of the initial verb to not cause trends in the response suggested in	Rewrite	I look for ways to earn enough income to meet expenses for a certain period (weekly, fortnightly, monthly, and yearly, among others). I understand the difference between gross income and net income.
B5	previous items and division of the item to encompass the understanding of gross income and net income.	Split	An individual's net income can fluctuate over time for various factors.
B6	One suggestion to differentiate the present and future sense of the sentence. Adequacy of the initial verb so as not to	Rewrite	It is necessary to earn enough income to enjoy the standard of living that I want in the present and that I aspire to in the future. Expenses are the outflows of money from the budget (spending on
B7	cause response tendencies, suggested in previous items.	Rewrite	health, education, housing, food, leisure, taxes, and other financial obligations to be fulfilled).
B8	Relevant averages and no comments.	Maintain	I carry out realistic planning of future expenses.
B9	Item adequacy, following the pattern, suggested in B3.	Rewrite	Record and compare expenses (planned) <i>versus</i> actual expenses (which have already happened or are happening).
B10	Item adequacy, following the pattern, suggested in B4.	Rewrite	I look for ways to adjust my expenses to the income of a certain period (weekly, fortnightly, monthly, and yearly, among others).
B11	One suggestion to better adapt the concept of "fixed and variable expenses".	Rewrite	In my budget, I consider that for each period (weekly, fortnightly, monthly, annual, among others), there are expected expenses, which may have fixed or variable amounts, and unexpected ones.
B12	Two comments suggest that the item measures the same as B6; however, B6 measures income and B12 expenses.	Maintain	I understand that it is necessary to spend intelligently and consciously to enjoy the standard of living that I want in the present and future.
B13	One suggestion to exemplify "means of payment".	Rewrite	I take into account the costs of the financial transactions of each payment method before using them (cash, checks, credit, debit and prepaid cards, vouchers, coupons, pix, and other online payment methods, among others).
B14	Five suggestions for exemplifying what would be "methods". We opted for the insertion of the term "tools".	Rewrite	I use methods and tools to improve the management of personal/domestic finances (notes, spreadsheets, and Apps, among others).
B15	Relevant averages and no comments.	Maintain	I feel comfortable discussing household budgeting with others when necessary.
B16	One suggestion for the insertion of the term "documents", adequacy of the initial verb so as not to cause response tendencies, suggested in previous items.	Rewrite	It is essential to record, archive records and documents, and track financial facts to build healthy financial habits.
B17	One suggestion to insert the term "purchase" and a suggestion to restructure the sentence.	Rewrite	I try to calculate, compare and interpret prices, and analyze products and suppliers before making purchase decisions.
B18	Item measures the same as FE11	Delete	
B19	Relevant averages and no comments.	Maintain	I set priorities, cut expenses, and change and adjust my financial plans when necessary.
B20	Relevant averages and no comments.	Maintain	I check if mistakes were made when making payments and purchases, which can hurt my budget.
B21	Two suggestions to exemplify what would be "financial products".	Rewrite	I periodically reassess the financial products I have (accounts, credit cards, limits and lines of credit, insurance, investments, among others).
B22	One suggestion to specify "decisions".	Rewrite	I consider my budgetary conditions and capabilities before making any decision that impacts my budget.

This dimension increased from 22 to 23 items, which will allow capturing the levels of knowledge, planning, and control of income and expenses, the adequacy of lifestyle to the budget, the methods and tools used in budget management, and the ability to talk about the budget with interested parties and the analytical and decision-making capacity applied to the elements of this dimension.

The intention is to confirm the extent to which budgeting practices are influenced by the level of financial education knowledge and to what time they can influence credit and indebtedness behaviors, savings and investment levels, and consumption habits. Additionally, it is intended to verify the relationship between budget control and knowledge of

sustainability and the production and disposal of waste, as well as their influences on the future and legacy.

Credit and indebtedness

This dimension aims to identify knowledge, behaviors, and practices about credit and indebtedness and has a total of 19 propositions, presented in Table 10. The studies based on the constructs of this dimension were: Marques and Frade (2003), Levine (2005), Lyons, Hill and Kozup (2007), Stango and Zinman (2009), Rachlis and Scherpf (2007), Lusardi and Tufano (2009), Gathergood (2012), Agarwal and Mazumder (2013), Gerardi *et al.* (2013), Scheresberg (2013), Zinman (2015), Silva, Silva Neto and Araújo (2017) and Cude, Chatterjee and Tavosi (2020).

The approach of the following constructs was chosen: understanding of interest rates (CI1), understanding of taxes (CI2), well-being and quality of life (CI3 and CI13), compliance with deadlines and conditions (CI4, CI7, CI8, and CI17), vision for amortization (CI5), understanding of insolvency (CI9 and CI10), analytical and decision-making capacity in credit (CI6, CI14, CI16, and CI19), budget understanding and control (CI12 and CI15) and risk perception (CI11 and CI18).

Table 10
Items proposed in the Credit and Indebtedness dimension

Initials	Proposed item	Average Adequacy	Average Clarity
CI1	I know how to apply interest rates on loans and financing.	4,64	4,82
CI2	I know the taxes that involve most credit operations.	4,73	4,82
CI3	I recognize the relationship between current indebtedness and future financial well-being.	4,73	4,55
CI4	I meet deadlines and commitments as agreed.	4,82	4,82
CI5	I evaluate the benefits of amortization or early settlement of debts.	4,73	4,82
CI6	When I need to take out some credit, I always research and compare the conditions in the public institutions before making decisions.	4,73	4,64
CI7	I seek help, talk to creditors and try to negotiate terms in advance if I cannot honor the debt.	4,82	4,82
CI8	I take steps to avoid delays in payments.	3,36	4,73
CI9	I am aware of the implications of non-payment of debt and taxes on credit scores and access to public services.	4,73	4,45
CI10	I prioritize certain debts in case they become unmanageable.	4,82	4,82
CI11	I make informed and conscious decisions about the financial and social consequences and responsibilities of accepting to be a guarantor or guarantor of third-party credit operations.	4,73	4,73
CI12	I believe carrying out, monitoring, and controlling the budget can avoid indebtedness.	4,73	4,73
CI13	I think debts are capable of interfering with my quality of life.	4,73	4,82
CI14	I assess my ability to pay before taking out loans.	4,73	4,64
CI15	Budget control brings more peace of mind so that it is possible to choose the best conditions in case of need for indebtedness.	4,73	4,64
CI16	I am able to differentiate and assess what type of credit can increase my income and wealth in the future of consumer credit.	4,73	4,36
CI17	I do my best to maintain good payer evaluation (score) levels.	3,55	4,64
CI18	I understand the risks and differences between formal and informal credit providers.	4,73	4,82
CI19	It analyzes the pros and cons of the different lines and conditions of credit available, according to your objectives.	4,64	4,64

According to Table 10, the worst evaluations in the adequacy criterion were for items CI8, with an average of 3.36, and CI17, with an average of 3.55, which ended up being

suppressed in item CI4; as for the clarity of statements, although all items have reached relevant averages for maintenance, it was decided to rewrite CI3, CI4, CI6, CI9, CI11, CI12, CI13, CI14, CI16, and CI19, considering the comments and suggestions, verified in Table 11.

Table 11

Credit and Indebtedness dimension after validation

Initials	Result	Action	Reevaluated item
CI1	Relevant averages and no comments.	Maintain	I know how to apply interest rates on loans and financing.
CI2	Relevant averages and no comments.	Maintain	I know the taxes that involve most credit operations.
CI3	One suggestion for rewriting, including the concept of financial sacrifice.	Rewrite	Indebtedness in the present can sacrifice income and financial well-being in the future.
CI4	Four suggestions to suppress CI4 and CI8 in a single sentence.	Rewrite	I do my best to fulfill deadlines and take measures to avoid payment delays, thus maintaining the best levels of good payer evaluation (score).
CI5	Relevant averages and no comments.	Maintain	I evaluate the benefits of amortization or early settlement of debts.
CI6	One suggestion to rewrite the section "condition in institutions" and a suggestion to include "negotiation of conditions".	Rewrite	When I need to take out some credit, I always research and compare the conditions offered by different institutions and try to negotiate before making decisions.
CI7	Relevant averages and no comments.	Maintain	I seek help, talk to creditors and try to negotiate terms in advance if I cannot honor the debt.
CI8	Four suggestions to suppress CI4 and CI8 in a single sentence.	Delete	
CI9	An unheeded suggestion is that CI9 measures the same thing as CI1 and CI2. A heeded suggestion to rewrite the sentence and improve understanding.	Rewrite	The non-payment of debts and taxes can influence the assessment of good payers (score) and even access to public services.
CI10	Relevant averages and no comments.	Maintain	I prioritize certain debts in case they become unmanageable.
CI11	One suggestion to rewrite the sentence.	Rewrite	There are financial and social risks and responsibilities in accepting to be a guarantor or guarantor of third-party credit operations.
CI12	Adequacy of the initial verb to avoid response tendencies suggested in previous items.	Rewrite	The realization, monitoring, and control of the budget can avoid indebtedness.
CI13	Adequacy of the initial verb to avoid response tendencies suggested in previous items and deletion of the word "my".	Rewrite	Debts are capable of interfering with the quality of life.
CI14	A suggestion for the inclusion of "funding".	Rewrite	I assess my ability to pay before taking on loans and funding.
CI15	Relevant averages and no comments.	Maintain	Budget control brings more peace of mind so that it is possible to choose the best conditions in case of need for indebtedness.
CI16	One suggestion to rewrite the sentence.	Rewrite	I can differentiate what type of credit can increase my income and wealth in the future from consumer credit.
CI17	Item suppressed in CI4	Delete	
CI18	Relevant averages and no comments.	Maintain	I understand the risks and differences between formal and informal credit providers.
CI19	Two suggestions for rewriting the sentence.	Rewrite	I analyze the pros and cons of the different lines and conditions of credit available according to my goals.

Although the items in this dimension have been reduced from 19 to 17, it continues to measure, without loss of consistency, knowledge about interest rates and taxes, behavior in seeking credit and conditions, perceptions of quality of life and health, commitment to the maintenance of the agreed conditions, perception of the consequences and risks of indebtedness and default, the analytical and decision-making capacity in the acquisition of credit and the effects of the budget on the use of credit.

The objective is to confirm if the characteristics of indebtedness are rooted in the lack of basic knowledge of personal finance, budgetary control, and consumption habits and if they influence the levels of savings and investment and the expectations of the future and legacy. It is also intended to verify the relationship between credit and indebtedness with the sustainability dimension and the production and disposal of waste.

Savings and Investment

This dimension aims to identify knowledge, behaviors and practices about savings and investment and had a total of 24 propositions, presented in Table 12. The following base literature was used: Lusardi (2000), Nugent and Yhee (2002), Cagetti (2003), Santos and Santos (2005), Cole, Sampson and Zia (2011), Lusardi and Mitchell (2011), Hibbert, Lawrence and Prakash (2012), Torres and Barros (2014), Kaiser and Menkhoff (2017), Moreno-García, Santillán and Gutiérrez-Delgado (2017), Lyons and Kass-Hanna (2019), Trinh, Morgan and Sonobe (2020), Fan and Zhang (2021) and López-Rodríguez and López-Ordoñez (2022).

The following constructs were addressed: awareness of the differences between saving and investing (SI1), the importance of the emergency reserve (SI2), understanding of external factors (SI4), perception of risk and return (SI5, SI10, SI15, and SI16), conditioning factors savings and investment (SI6), sustainable behavior (SI7), inclination towards sustainable investments (SI8, SI9, SI14, and SI22), investment analysis and decision-making capacity (SI11, SI12, SI13, and SI19), budget practices (SI17), perception of asset pricing and variation (SI18), transaction costs (SI20), understanding of investment elements (SI21) and liquidity (SI3) and feeling of well-being (SI23 and SI24).

Table 12
Items proposed in the Savings and Investment dimension

Initials	Proposed item	Average Adequacy	Average Clarity
SI1	I know the difference between saving and investing.	4,82	4,82
SI2	I am aware that an emergency reserve is essential to protect against financial shocks.	4,73	4,82
SI3	I know that some investments are more liquid than others.	4,73	4,00
SI4	Investments can be impacted by various external facts and market uncertainties such as environmental catastrophes, climate change, and international ones.	4,73	4,45
SI5	I evaluate the relationship between risks and returns associated with different financial products.	4,64	4,64
SI6	The greater an individual's financial education knowledge, the greater their level of savings/investment.	4,73	4,82
SI7	I believe that the lower an individual's savings/investment levels, the less likely he or she will be to engage in sustainable actions.	4,27	4,73
SI8	I believe that sustainable institutions' bonds and securities (shares, promissory notes, debentures, fund shares, among others) are more advantageous.	4,45	4,45
SI9	Sustainable institutions are more successful and are better options for investors.	3,55	4,73
SI10	I assess the risks of my investments.	3,55	4,73
SI11	I evaluate performance and investment possibilities based on data and information from reliable sources and avoid dubious influences and sources of information.	4,55	4,55
SI12	I understand the functioning and conditions of a private pension plan.	4,64	4,82
SI13	I have private pension investments.	2,91	4,36
SI14	There are many sustainable investment options available, and I know where to find them and how to purchase them.	4,27	4,82
SI15	I know my level of tolerance for investment risks.	4,64	4,82
SI16	Some investment risks can be minimized through diversification.	4,73	4,82
SI17	I set savings goals, outline strategies, and strive to achieve them.	4,55	4,64
SI18	I am aware that the value of investments in tangible and intangible assets can undergo positive and negative variations.	4,55	4,82
SI19	I monitor my investments periodically and make adjustments when necessary.	4,64	4,82
SI20	I am aware that some investment products have associated costs, such as administration, entry, exit, performance, brokerage fees, commissions, taxes, and charges.	4,73	4,82
SI21	I understand that every investment involves risk, risk tolerance, investment horizon, liquidity, and	4,73	4,82

	investment objectives.		
SI22	I am willing to boost investments that improve social and environmental problems.	4,73	4,82
SI23	Having some savings/investment decreases symptoms such as stress, anxiety, worry, and dissatisfaction and increases well-being and security.	4,45	4,82
SI24	Those who have savings reserves are less exposed to vulnerabilities.	4,64	4,73

As can be seen in Table 12, the worst means for the adequacy criterion were SI13 with 2.91, which resulted in its exclusion, and SI9 and SI10, both with 3.55. In the clarity of the statement, all means were considerably high, but as shown in Table 13, most items were rewritten, following previous standardizations and suggestions. Items SI9 and SI8 were suppressed in a single item, as well as SI10 and SI15, while SI14 was divided into two sentences for better understanding.

Table 13
Savings and Investment dimension after validation

Initials	Result	Action	Reevaluated item
SI1	Relevant averages and no comments.	Maintain	I know the difference between saving and investing.
SI2	Adequacy of the initial verb to avoid response tendencies suggested in previous items and deletion of the word "my".	Rewrite	Having an emergency fund is essential to protect yourself from financial shocks.
SI3	Three suggestions for clarifying the term "liquidity".	Rewrite	Some investments are more liquid than others; they convert into resources that can be used more quickly and easily.
SI4	Two suggestions are to replace the term "fact" with "factors" and one suggestion to include the term "political scenario".	Rewrite	Investments can be impacted by various external factors and uncertainties such as environmental catastrophes, climate change, terrorism, political scenario, and the international market, among others.
SI5	One suggestion to change the term "financial products" to "investment products".	Rewrite	I evaluate the relationship between risks and returns associated with different investment products.
SI6	Relevant averages and no comments.	Maintain	The greater an individual's financial education knowledge, the greater their level of savings/investment.
SI7	One unheeded suggestion that the item does not belong in the dimension. It was understood that the item compares the level of savings and investment with sustainable behavior.	Maintain	I believe that the lower an individual's savings/investment levels, the less likely he or she will be to engage in sustainable actions.
SI8	One suggestion to reframe the term "advantageous", a suggestion to improve the understanding of "sustainable institutions", and a suggestion not accepted to exclude the item, as it was understood that it is in the scope of investments.	Rewrite	I believe that bonds and securities (shares, promissory notes, debentures, fund shares, among others) from institutions that promote the improvement of social and environmental problems are more attractive and advantageous investment options.
SI9	Four accepted suggestions that SI9 measures the same as SI8.	Delete	
SI10	Four accepted suggestions that SI5 measures the same as SI10.	Delete	
SI11	Relevant averages and no comments.	Maintain	I evaluate performance and investment possibilities based on data and information from reliable sources and avoid dubious influences and sources of information.
SI12	Relevant averages and no comments.	Maintain	I understand the functioning and conditions of a private pension plan.
SI13	Average of 2.91 and two comments that the question is of duality, not being able to apply Likert.	Delete	
SI14	Two suggestions that the sentence evaluates two factors, and one suggestion to specify the term "sustainable". It was decided to divide them for better understanding.	Split	There are many options available for sustainable investments, that is, investments that promote the resolution of social and environmental problems. It is easy to find and acquire sustainable investments.
SI15	Relevant averages and no comments.	Maintain	I know my level of tolerance for investment risks.
SI16	Relevant averages and no comments.	Maintain	Some investment risks can be minimized through diversification.
SI17	Relevant averages and no comments.	Maintain	I set savings goals, outline strategies, and strive to achieve them.
SI18	Adequacy of the initial verb to avoid response tendencies suggested in previous	Rewrite	The values of investments in tangible and intangible assets may undergo positive and negative variations.

	items.		
SI19	Relevant averages and no comments.	Maintain	I monitor my investments periodically and make adjustments when necessary.
SI20	Adequacy of the initial verb to avoid response tendencies suggested in previous items.	Rewrite	Some investment products have associated costs, such as: administration, entry, exit, performance, brokerage fees, commissions, taxes, and charges.
SI21	Adequacy of the initial verb to avoid response tendencies suggested in previous items.	Rewrite	Every investment involves risks, risk tolerance, investment horizon, liquidity, and investment objectives.
SI22	One suggestion to replace the term "improve" with "promote improvements".	Rewrite	I am willing to boost investments that promote improvements in social and environmental problems.
SI23	Relevant averages and no comments.	Maintain	Having some savings/investment decreases symptoms such as stress, anxiety, worry, and dissatisfaction and increases well-being and security.
SI24	A suggestion to specify the term "vulnerabilities".	Rewrite	Those who have savings reserves are less exposed to social and environmental vulnerabilities.

This was one of the dimensions that underwent the most changes, going from 24 proposed items to 22. Still, it measured the perceptions of the difference between savings and investment, emergency reserve needs, understanding of external factors, and sensitivity to trade-off risk. /return, savings and investment constraints, inclination towards sustainable investments, analytical and decision-making skills applied to investments, budgeting practices that influence investments, perception of variation and asset pricing, transaction costs, understanding of the elements of investment, including liquidity, and the sense of well-being caused by levels of savings and investment.

It is intended to confirm whether savings and investment behaviors are rooted in financial education, whether they are potentiated by budgetary control and consumption habits, whether they influence and are influenced by credit and indebtedness behaviors, and whether they impact future and legacy expectations. It is also intended to verify what type of relationship there is between savings and investment with the sustainability dimension and with the production and disposal of waste.

Consumption and Waste

This dimension aims to identify knowledge, behaviors, and practices about consumption habits and the production and disposal of waste and has a total of 20 propositions, presented in Table 14. The literature that supported this dimension was: Mancebo *et al.* (2002), Belk, Ger and Askegaard (2003), Brennan and Coppack (2008), Grimm *et al.* (2008), Aquino and Tomassini (2009), Hira (2012), Willis and Schor (2012), Anderson *et al.* (2013), Charles-Leija, Aboites and Llamas (2018), Halilovic *et al.* (2019) and He *et al.* (2020).

The following constructs were addressed: green consumption behavior (CW1, CW2, CW10), willingness to sustainable practices (CW3 and CW8), ability to evaluate suppliers (CW4), recycling behavior (CW7), perception of consumption budget (CW9), financial

advantages of conscious consumption (CW11 and CW13), availability to participate in sustainable actions (CW12), analytical and decision-making process of consumption (CW5, CW6, and CW14), perception of shared advantage (CW15), external factors (CW16 and CW17) and perception of production volume and waste disposal practices (CW18, CW19, and CW20).

Table 14
Items proposed in the Consumption and Waste dimension

Initials	Proposed item	Average Adequacy	Average Clarity
CW1	I always assess how sustainable a product/service is before I buy.	4,55	4,82
CW2	I consume more from companies with sustainable policies.	4,73	4,82
CW3	I am encouraged to participate in sustainability actions promoted by the companies I consume.	4,18	4,18
CW4	The companies from which I consume are concerned with the waste generated by their activity.	4,45	4,64
CW5	I would rather buy something new than fix what I already have.	4,45	4,82
CW6	I make the most of something before discarding it.	4,73	4,82
CW7	I always separate the garbage and contribute to reverse logistics.	4,73	2,82
CW8	I feel willing to participate in sustainability actions promoted by public, private, or civil society initiatives.	4,64	4,64
CW9	I deprive myself or postpone consuming products/services whose prices are outside my budget, even if I want to.	4,27	4,64
CW10	I refuse to consume from companies that contribute to the degradation of the environment.	4,64	4,73
CW11	Consumption in a sustainable way brings financial advantages.	4,27	4,45
CW12	Sustainable products and services are easier to find.	4,55	4,73
CW13	Sustainable products and services are cheaper.	4,45	4,73
CW14	I assess whether my purchase decisions are needs or wants and can establish priorities.	4,36	4,64
CW15	Sustainable actions are advantageous for the company and for the customer.	4,00	4,64
CW16	I recognize the influences that advertisements, promotions, and the media, in general, can have on my evaluations and consumption decisions.	4,18	4,64
CW17	I feel that there is a lack of effective initiatives involving the government, companies, and consumers concerning waste production.	4,55	4,64
CW18	I always look for alternative destinations for my waste and only dispose of it in the common trash if there is no alternative.	4,55	4,45
CW19	It is easy to dispose of trash and waste sustainably.	4,36	4,55
CW20	I am aware that the more I consume, the more garbage and waste I produce.	4,55	4,64

As seen in Table 14, all items in this dimension received high averages in the criterion of adequacy to the dimension; however, for the criterion of clarity of the statement, the item CW7 obtained an average of 2.82; in this way, it was rewritten. All items were kept, except for CW3, CW7, CW11, CW15, CW16, CW17, and CW20, changed according to the experts' comments and suggestions in Table 15.

Table 15
Consumption and Waste dimension after validation

Initials	Result	Action	Reevaluated item
CW1	Relevant averages and no comments.	Maintain	I always assess how sustainable a product/service is before I buy.
CW2	A comment to exemplify the term "sustainable".	Rewrite	I consume more from companies with sustainable policies (clean energy, recycled materials, reverse logistics, and saving resources in production, among others).
CW3	Three suggestions for replacing "am" with "I feel".	Rewrite	I feel encouraged to participate in sustainability actions promoted by the companies I consume.
CW4	Relevant averages and no comments.	Maintain	The companies from which I consume are concerned with the waste generated by their activity.
CW5	Relevant averages and no comments.	Maintain	I would rather buy something new than fix what I already have.
CW6	Relevant averages and no comments.	Maintain	I make the most of something before discarding it.
CW7	Five suggestions for item restructuring.	Rewrite	I always separate and dispose of domestic waste properly and seek to contribute to reverse logistics actions.

CW8	Relevant averages and no comments.	Maintain	I feel willing to participate in sustainability actions promoted by public, private, or civil society initiatives.
CW9	Relevant averages and no comments.	Maintain	I deprive myself or postpone consuming products/services whose prices are outside my budget, even if I want to.
CW10	Relevant averages and no comments.	Maintain	I refuse to consume from companies that contribute to the degradation of the environment.
CW11	Duas sugestões para reestruturação do item.	Rewrite	Consuming consciously generates savings in financial resources.
CW12	Relevant averages and no comments.	Maintain	Sustainable products and services are easier to find.
CW13	Relevant averages and no comments.	Maintain	Sustainable products and services are cheaper.
CW14	Relevant averages and no comments.	Maintain	I assess whether my purchase decisions are needs or wants and can establish priorities.
CW15	Two suggestions for item restructuring.	Rewrite	Sustainable actions can be advantageous for both the company and the customer.
CW16	One suggestion for restructuring the item.	Rewrite	Advertisements, promotions, and the media's actions, in general, can influence my ratings and consumption decisions.
CW17	One suggestion for restructuring the item.	Rewrite	There is a lack of effective initiatives involving the government, companies, and consumers regarding containing the volume and improving waste destination.
CW18	Relevant averages and no comments.	Maintain	I always look for alternative destinations for my waste and only dispose of it in the common trash if there is no alternative.
CW19	Relevant averages and no comments.	Maintain	It is easy to dispose of trash and waste sustainably.
CW20	Adequacy of the initial verb to avoid response tendencies suggested in previous items.	Rewrite	The more I consume, the more garbage and waste I produce.

This dimension was one of those that did not undergo significant changes, and it continues to measure how consumption behaviors are influenced by financial education and sustainability; they need to involve investigations of green consumption behavior, willingness to sustainable practices related to the act of consumption and its consequences, the ability and desire to select sustainable suppliers, how recycling behavior interferes with the way consumption is carried out, and waste is treated, perception of budgetary control in consumption, the financial advantages of conscious consumption, the perception of the possibility of integrative bargaining approach between client/company, the analytical and decision-making process of consumption, the external factors that can influence consumption practices and the understanding of the relationship between the volume of consumption and the volume of waste production.

In this dimension, the objective is to confirm if consumption behaviors are directly influenced by the level of financial education and sustainability, if the level of indebtedness results from consumption practices, if budget practices guide consumption habits and if these are related to the volume of savings and investment. It is also intended to verify the relationship between consumption and waste with the future and legacy, as well as the relationship of the other dimensions with the generation of waste.

Future and legacy

This dimension aims to identify behaviors, practices, and expectations projected for the future and legacy, given the antecedent context of knowledge and behaviors, with 20

propositions presented in Table 16. The literature that supported this dimension was: Bucher-Koenen and Lusardi (2011), Sekita (2011), Madrian and Skimmyhorn (2013), Zhu and Xiao (2021), Hastings, Maman and Rosenhek (2019), Hibbert, Lawrence, and Prakash (2012), Berry, Karlan, and Pradhan (2018).

The following constructs were addressed: assessment of social security devices for (FL1), quality of life and environment (FL2), legacy and finances (FL3), legacy and sustainability (FL4), aging needs (FL5 and FL14), retirement preparation (FL6 and FL20), well-being (FL7), behavior about the insurance market (FL8 and FL10), succession planning (FL9 and FL11), quality of life (FL12), reflection and understanding of external factors (FL13), risk assessment (FL15), sense of community (FL16 and FL17), personal finances and sustainable habits (FL18 and FL19).

Table 16
Items proposed in the Future and Legacy dimension

Initials	Proposed item	Average Adequacy	Average Clarity
FL1	I believe that the government's devices are enough to have a comfortable future.	4,60	4,50
FL2	I believe that the conditions of the environment do not influence the level of quality of life that I intend to have in the future.	4,00	4,50
FL3	The best legacy I can leave for posterity is financial resources, assets, and rights.	4,20	4,60
FL4	The best legacy I can leave for posterity are teachings, life examples, and education.	4,60	4,70
FL5	I am aware that few people have income from work in old age and I recognize the importance of ensuring an alternative source of income.	4,60	4,80
FL6	I allocate part of my income to retirement.	4,50	4,80
FL7	I recognize that an individual's well-being involves both financial and non-financial factors.	4,50	4,70
FL8	I understand that many health, life and property risks can be protected or minimized by insurance.	4,40	4,70
FL9	I believe that estate succession planning is able to reduce costs and bring more tranquility to the family and future heirs.	4,70	4,50
FL10	I have some type of insurance against health, life and property risks.	4,50	4,50
FL11	I have defined the succession planning of my estate.	3,30	4,00
FL12	The greater my financial and environmental awareness, the less exposed to vulnerabilities I will be during life and old age.	4,70	4,80
FL13	I believe that the more financially and environmentally literate I will be, the more I will be able to understand the society around me.	4,70	4,80
FL14	The financial situation implies the longevity of the individual.	4,30	4,70
FL15	I am aware of the risks of losing part or all of the family income due to the death, unemployment, disability and health problems of a family member.	4,70	4,70
FL16	Collective well-being involves an environmentally sound world and a society with fewer social differences caused by money.	4,60	4,70
FL17	The more people oriented toward financial education and sustainability, the greater the collective well-being.	4,70	4,70
FL18	The better my financial condition, the more likely I will develop sustainable habits.	4,40	4,80
FL19	In both personal finance and sustainability, it is vital to have consistent, long-term habits.	4,40	4,50
FL20	I am willing to save and invest for retirement.	4,60	4,50

For the adequacy criterion, as shown in Table 16, only item FL11 received a low average of 3.30, opting for its suppression in FL9; as for the clarity of the statement, all averages were satisfactory, but most of the items were rewritten, for standardization and according to the comments, as shown in Table 17.

Table 17
Future and Legacy dimension after validation

Initials	Result	Action	Reevaluated item
FL1	One suggestion to exemplify "government's devices". Adequacy of the initial verb to avoid response tendencies suggested in previous items.	Rewrite	The government's social security devices (social security, social assistance, and health) are sufficient for a comfortable future.
FL2	Adequacy of the initial verb to avoid response tendencies suggested in previous items.	Rewrite	The environmental conditions do not influence the level of quality of life that I intend to have in the future.
FL3	Relevant averages and no comments.	Maintain	The best legacy I can leave for posterity is financial resources, assets, and rights.
FL4	Relevant averages and no comments.	Maintain	The best legacy I can leave for posterity are teachings, life examples, and education.
FL5	Adequacy of verbs to avoid response tendencies, suggested in previous items.	Rewrite	Few people have income from work in old age, so it is crucial to ensure an alternative source of income during this period.
FL6	Relevant averages and no comments.	Maintain	I allocate part of my income to retirement.
FL7	Adequacy of the initial verb to avoid response tendencies suggested in previous items.	Rewrite	An individual's well-being involves both financial and non-financial factors.
FL8	One suggestion to change the term "protected" to "avoided." Adequacy of the initial verb to avoid response tendencies suggested in previous items.	Rewrite	Many health, life, and property risks can be avoided or minimized by insurance.
FL9	One suggestion to clarify "succession planning." Adequacy of the initial verb to avoid response tendencies suggested in previous items.	Rewrite	Estate succession planning (the strategy adopted for transferring a person's assets after death) can reduce costs and bring more peace of mind to the family and future heirs.
FL10	One suggestion for restructuring the sentence to fit the Likert scale.	Rewrite	Having some insurance against property, health, and life risks are essential.
FL11	Two suggestions are that FL11 measures the same as FL9.	Delete	
FL12	Relevant averages and no comments.	Maintain	The greater my financial and environmental awareness, the less exposed to vulnerabilities I will be during life and old age.
FL13	Adequacy of the initial verb to avoid response tendencies suggested in previous items.	Rewrite	The more financially and environmentally literate, the more I will be able to understand the society around me.
FL14	Relevant averages and no comments.	Maintain	The financial situation implies the longevity of the individual.
FL15	Adequacy of the initial verb to avoid response tendencies suggested in previous items.	Rewrite	It is crucial to protect yourself from the risks of losing, in part or in full, the family income due to a family member's death, unemployment, disability, and health problems.
FL16	Relevant averages and no comments.	Maintain	Collective well-being involves an environmentally sound world and a society with fewer social differences caused by money.
FL17	Relevant averages and no comments.	Maintain	The more people oriented toward financial education and sustainability, the greater the collective well-being.
FL18	Relevant averages and no comments.	Maintain	The better my financial condition, the more likely I will develop sustainable habits.
FL19	Relevant averages and no comments.	Maintain	In both personal finance and sustainability, it is vital to have consistent, long-term habits.
FL20	One suggestion to include the term "future."	Rewrite	I am willing to save and invest, thinking about retirement and the future.

This dimension proposed 20 items, leaving 19 after validation, not changing its objectives of evaluating people's perception of trust in social security devices, the relationship between quality of life and the environment, the relationship between legacy, finances and sustainability, needs and preparations for the aging and retirement process, well-being, quality of life, safety, risk perception, and protection and mitigation strategies, succession planning strategies, the interference of factors external factors, a sense of community and sustainable habits that reduce the insecurities of the future.

This last dimension is a compilation of knowledge and behaviors, the results being highly dependent on all the previous dimensions. The objective is to verify if the more prepared by the environmental factors (antecedents), the more the action (behavioral factors) will be guided towards the consequence (consequence factors), whether rewarding or punitive.

Discussion

The instrument attempts to integrate concepts of instrumental finance and emancipatory finance with elements of sustainable consumption and production and disposal of waste, as well as analyze the extent to which these practices simultaneously contribute to and are motivated for the future and their alignment with the individual's legacy expectations.

Initially, 139 items were proposed, and after validation, 137 items remained, gathered in Table 18, demonstrating that the quantitative reduction of the items considerably impairs the foundation of the dimensions, the research objectives, and the tool itself. Simultaneous validation by finance and sustainability experts found that the items addressed refer to the scope of each dimension and brought important positions for the refinement of sentences, given the plurality of the potential audience in application in future research.

Table 18
Start and end items by dimension

Factors	Dimensions	Quantity of proposed items	Quantity of end items
Antecedentes	Financial education	18	19
	Sustainability	16	17
	Personal/domestic budget	22	23
Practice and Behavior	Credit and indebtedness	19	17
	Savings and investment	24	22
	Consumption and waste	20	20
Consequences/result	Future and legacy	20	19
TOTAL		139	137

The contribution of this instrumental advance is a step towards the conceptual advance when it compiles and outlines the scope of the significant areas of financial education dispersedly measured in the literature studies. Another contribution was dimensionalization, which preserves the independence of each dimension without harming possible cause-and-effect relationships. The last advance was the search for a theoretical and practical balance in the interaction between financial education and the tripod of sustainability.

The main objective is to interpret the results at the dimension level, especially the last one since it synthesizes the others. However, other issues are of great interest, such as the intentions of financial investments in sustainable projects, the financial impacts of waste management at the individual level, and the potential conflict between financial and non-financial expectations for the future and legacy.

5. Final remarks

This work initially attempted to propose the relevant items involved in the dimensions of the relationship between financial education and sustainability in behavior. 139 items were proposed, divided into seven dimensions: financial education, sustainability, budget, credit and indebtedness, savings and investment, consumption and waste, and future and legacy. The propositions were validated by specialists regarding the adequacy of the item in the dimension and the clarity of the statement through ordering scales. After validation, 137 items remained, based on the average score obtained in each criterion and according to the experts' suggestions and comments.

The innovations addressed in this study are the proposed scope of dimensions, which end up being a timid step in the conceptual convergence of financial education and the critical inclusion of the environmental pillar in the interaction between financial education and the tripod of sustainability. With the structure, contents, and psychometric attributes validated, we recommend the instrument for longitudinal experiments but is also suitable for cross-sectional studies. The instrument can also be used to formulate interview and case study scripts.

The limitation of this study was the theoretical concentration, bringing the need for empirical testing in groups, which will undoubtedly enable the emergence of new relationships, questions, and findings. As a suggestion for future studies, in addition to indicating its application, we suggest the partial or total test of the dimensions with other themes that may involve financial education, sustainability, and consumption.

CONCLUSION

The first paper of this dissertation brought the clustered bibliometric map of scientific discussions between the fields studied, supported by an analysis of the co-occurrence of words. The contribution of the work to the scientific community is in the visualization of the gain in popularity of discussions on financial education around the world since 2011, with the United States having the largest share of productivity, both at the national and institutional levels. Although the countries that are right after it (Brazil and China) occupy timid positions in terms of productivity, being on the list of the most productive is an important indicator to decentralize the debate from instrumental financial education to emancipatory one.

Still, with the prominent journals focused on consumer behavior and the principal authors rarely collaborating, there is much difficulty in the conceptual advancement of the field and its multidisciplinary application. The main topics covered in the papers are the differences between education and financial literacy and the lines of research divided into four major areas: 1) behavioral, 2) didactic, 3) practical, and 4) philosophical and multidisciplinary. The studies closest to sustainability are found precisely in the last area. With research focused on the economy and society, the relationship between financial education and the environment remains open.

The second paper proposed a conceptual framework with elements of the relationship between the fields of financial education and sustainability from a behavioral perspective. The contribution of the work is in the design of the relationship between the fields in behavior, considering that the levels of financial education and sustainability have a direct impact on budget planning and control, on the characteristics of seeking credit and investment, as well as on the levels of savings and indebtedness, in consumption behaviors and the production and disposal of waste. Moreover finally, this mix of behaviors determines and is determined, simultaneously, by the individual's future and legacy perspectives.

The third paper proposed the main items in the seven dimensions previously presented in paper 2. A total of 139 items were presented, validated by specialists regarding the adequacy of the item in the dimension and the clarity of the statement, through ordering scales. The choice of items was based on average criteria scores, leaving 137 items at the end. The study advanced in the proposed scope of dimensions, contributing to the conceptual consensus and including the environmental pillar in a balanced way with the economic and social pillars in the interaction of financial education.

The work was a step towards deepening the understanding of the relationship between financial education and sustainability, especially in the environmental pillar, which has been little investigated. Since the study focused on the conceptual sphere, this is its main limitation. However, as it is a highly budding interdisciplinarity relationship, the process of conceptual gathering and formulation of relational hypotheses and instrumentation become valuable in minimizing risks and problems in the practical application of future research.

Financial education has enormous potential to minimize the catastrophic social and environmental effects caused by the economic savagery of recent centuries. This knowledge was concentrated for a long time in a small part of society. Coincidentally, it is positioned at the top of the income concentration pyramid and is responsible for driving the economy and, consequently, the lives of thousands.

It is as if financial education is reserved for the top of the food chain, allowing only predators to hold the best social and environmental conditions, given the combination of economic power and financial literacy. The only checkpoint of this analogy is that, unlike normal conditions in nature, where the existence and death of predators generate the necessary inputs for the rebirth of life and the maintenance of balance, in the economic context, predators serve only themselves and their own class, in addition to causing entropy in the rest of the chain.

The instrumentalist approach to financial education, which has dominated the field for a long time, broadly represents the portion on which it was concentrated. The breaking of this pattern comes, precisely, with the democratization of this knowledge, providing the rest of the social pyramid with the essential knowledge to coexist in this economic system and combining it with disciplines capable of dressing financial education in citizenship attire.

It is possible to combine financial education with sustainability in schools, the job market, companies, institutions, and society, but it lacks collective effort from all spheres. The financial emancipation of the individual is one of the most fertile grounds to understand that money, per se, cannot be eaten, cannot be breathed, and does not bring happiness if the environment and his peers are in ruins.

Although this study was a small scientific step, it is hoped that, directly or indirectly, it can awaken the interest in financial education and the sustainability of whoever reads it.

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