

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

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### **Introdução**

Do several discussions involve understanding sustainability, mainly how far our finite resource planet can support unlimited economic growth? Given the financial crisis experienced in 2007, nations seek less aggressive economic arrangements that contemplate the balance between an inclusive economy, shared social well-being, and a healthy and sustainable environment. 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 finan

### **Problema de Pesquisa e Objetivo**

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. This whole scenario raises the following question: How are studies in financial education and sustainability? 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.

### **Fundamentação Teórica**

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 m

### **Metodologia**

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, followed the procedures suggested by Paré et al. (2016) for literature reviews approaching systematicity and transparency; the processes are repres

### **Análise dos Resultados**

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

### **Conclusão**

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 popular

### **Referências Bibliográficas**

Adams, G. & Rau, B. (2011). Putting Off Tomorrow to Do What You Want Today Planning for Retirement. *The American psychologist*. 66. 180-92. DOI: 10.1037/a0022131. Aleksandrova, O.A., Alikperova, N.V., Vinogradova, K.V., Nenakhova, Yu.S. (2020). Conceptual approaches to creating the preconditions for the effective financial education of the Russian population. *Economic and Social Changes. Vologda* vol. 13, no. 4, pp. 169–185. DOI: 10.15838/esc.2020.4.70.10 Atkinson, A., Mckay, S., Collard, S. & Kempson, E. (2007). Levels of Financial Capability in the UK. *Public Money & Management*. 27. 29-36. DOI

### **Palavras Chave**

Financial education, Financial literacy, Sustainability

# 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).

## **1. Research problem and objective**

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 on 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.

### **3. 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.

#### **4. 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, followed 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.

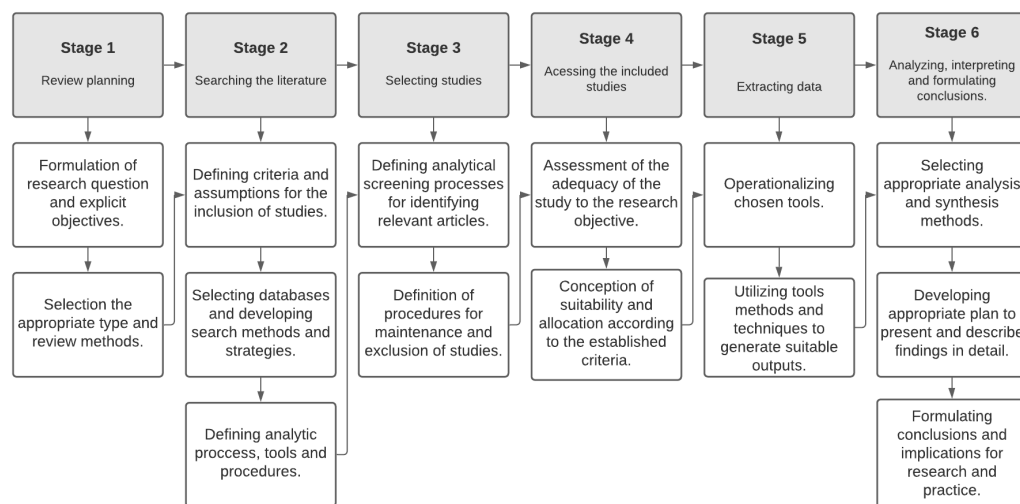


Figure 1. Instantiations of systematicity guidelines in the review process (Adapted from Paré *et al.*, 2016).

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.

And 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 2.

Table 2

**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](http://www.citnetexplorer.nl)) applied to the micro-level analysis and VOSviewer ([www.vosviewer.com](http://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.

## 5. 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 3, 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 3

### 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%
	<b>475</b>	<b>100,00%</b>

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 4 summarizes the data of this first analysis.

Table 4

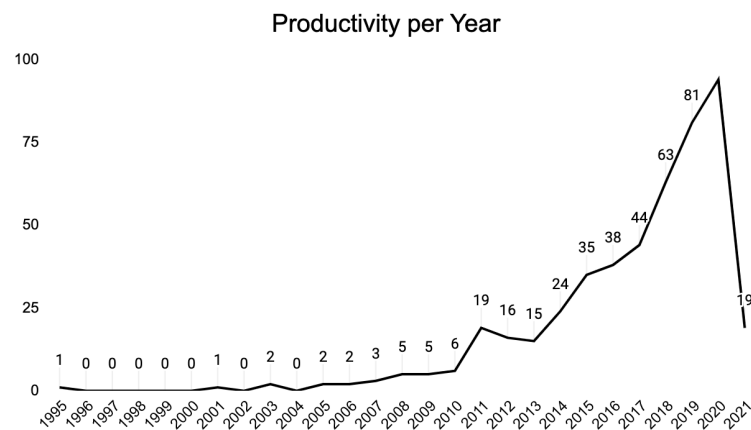
**Statistics for the data set of financial education and sustainability publications**

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.

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 5 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 5  
**The ten most productive authors, organizations, and countries**

Author	(Q) Documents	(%) of 475	Citations
Xiao, J	12	2,53%	340
Grinstein-Weiss, M	8	1,68%	122
Zia, B	8	1,68%	280
Collins, J	8	1,68%	181
Serido, J	6	1,26%	81
Loke, Y	6	1,26%	19
Shim, S	5	1,05%	80

Chatterjee, S	5	1,05%	72
Birkenmaier, J	5	1,05%	33
Zhu, A	5	1,05%	0

#### **Organization**

Washington University	15	3,16%	144
University Wisconsin	14	2,95%	307
University of North Carolina	13	2,74%	167
Ohio State University	12	2,53%	185
University Rhode Island	12	2,53%	340
World Bank	11	2,32%	251
University of Georgia	9	1,89%	128
University of Missouri	8	1,68%	110
Universiti Sains Malaysia	7	1,47%	19
National Bureau of Economic Research	7	1,47%	31

#### **Country**

United States of America	220	46,32%	4426
Brazil	26	5,47%	67
People's Republic of China	21	4,42%	188
England	20	4,21%	336
Malaysia	19	4,00%	65
Australia	17	3,58%	176
Italy	16	3,37%	50
Spain	16	3,37%	41
Germany	14	2,95%	297
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.

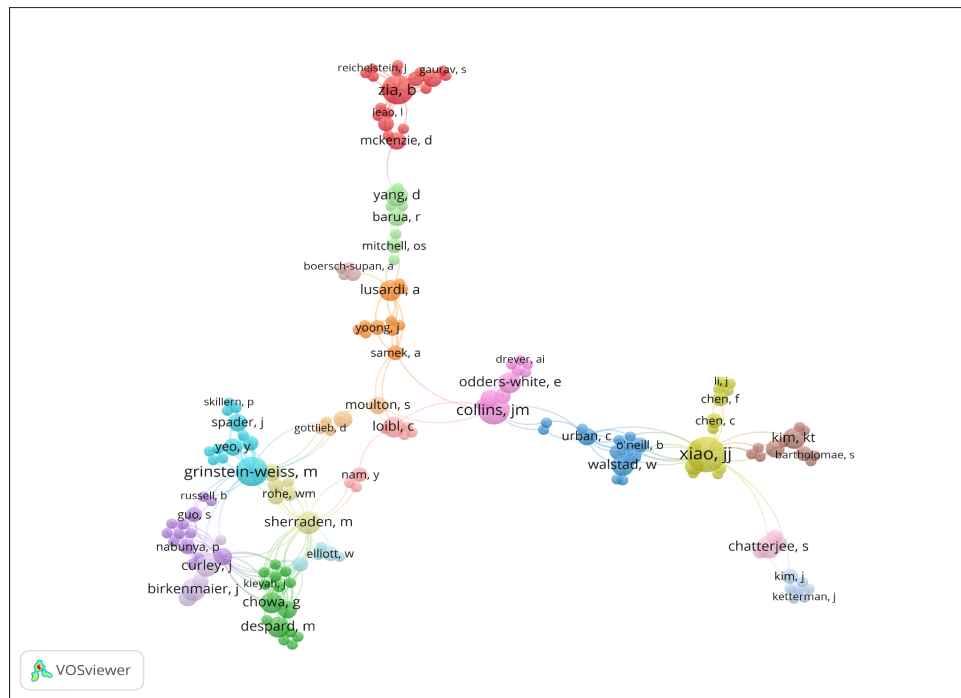


Figure 2. Co-authorship cluster solution - collaboration view by author.

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.

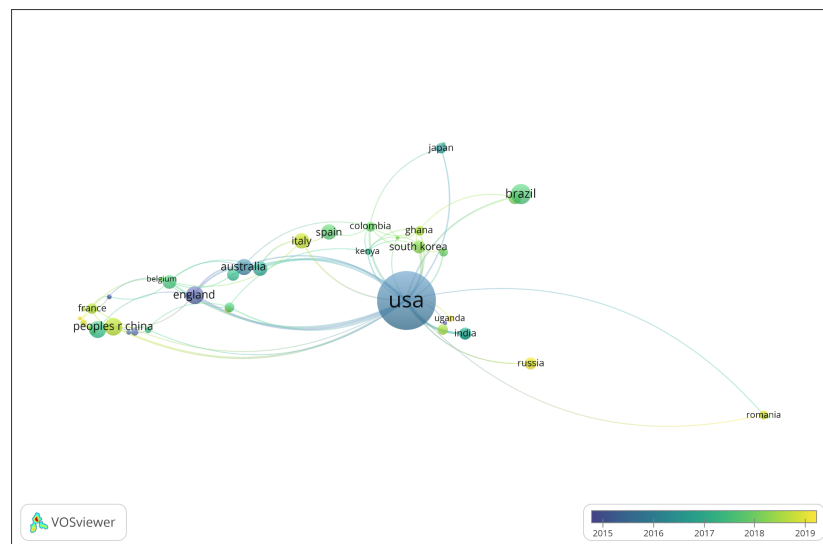


Figure 3. Co-authorship cluster solution - vision of collaboration by countries over the years.

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 6, 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 6  
**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.

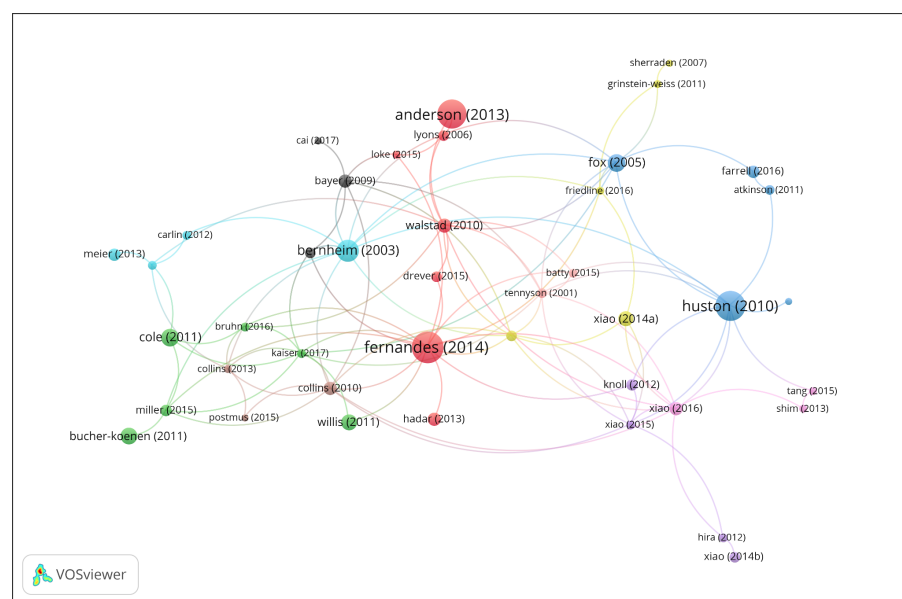


Figure 4. Citation cluster solution - vision by most internal cited documents.

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 7).

Table 7  
**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 8.

Table 8  
**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.

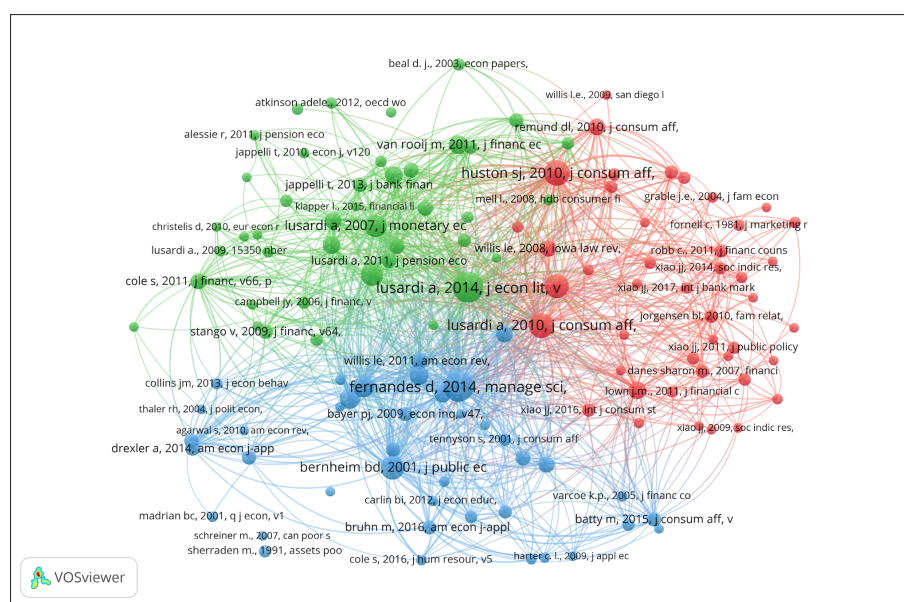
However, in percentage terms, as shown in Table 9, the most cited authors are present in less than 1% of the works, punctuating the characteristic of a research field still in an embryonic stage, which needs convergence and conceptual consistency to develop.

Table 9  
**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%

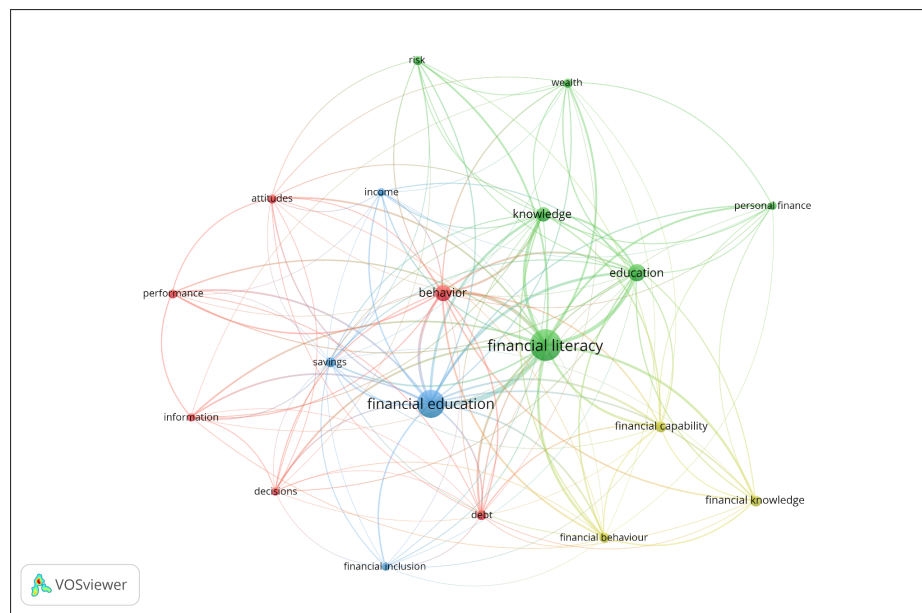
When adopting the criterion of a minimum of 2 citations per work, the number of papers cited drops to 2.004, confirming the seminality of some papers. For the cluster chart of the most cited external references, shown in Figure 5, the minimum criterion of 10 citations was adopted, and only 126 works 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.



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 - vision by most used keywords.*

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

According to Table 10, 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 10

**Summary of clustering solution - most used keywords**

	Term	Occurrence	Relevance
<b>Cluster 1 (red) - 6 items</b>			
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%
<b>Cluster 2 (green) - 6 items</b>			
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%
<b>Cluster 3 (blue) - 4 items</b>			
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%
<b>Cluster 4 (yellow) - 3 items</b>			
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.

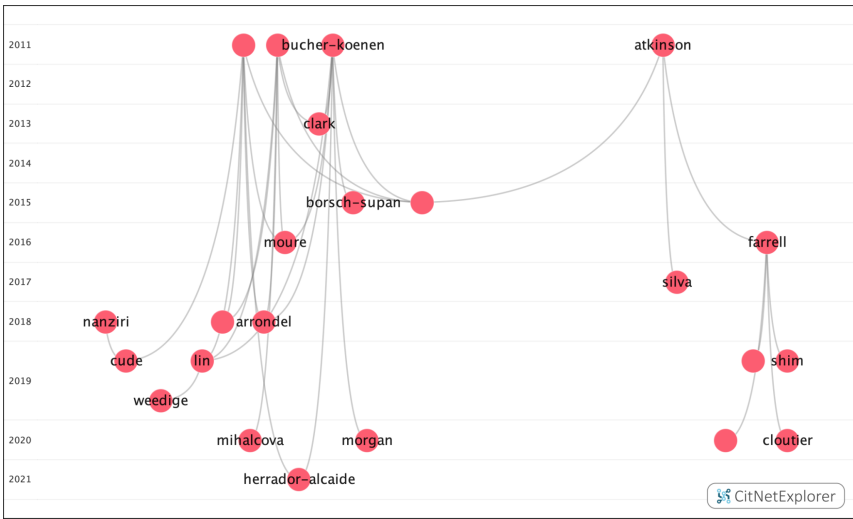


Figure 7. Cluster 1 - Behavioral lines

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.

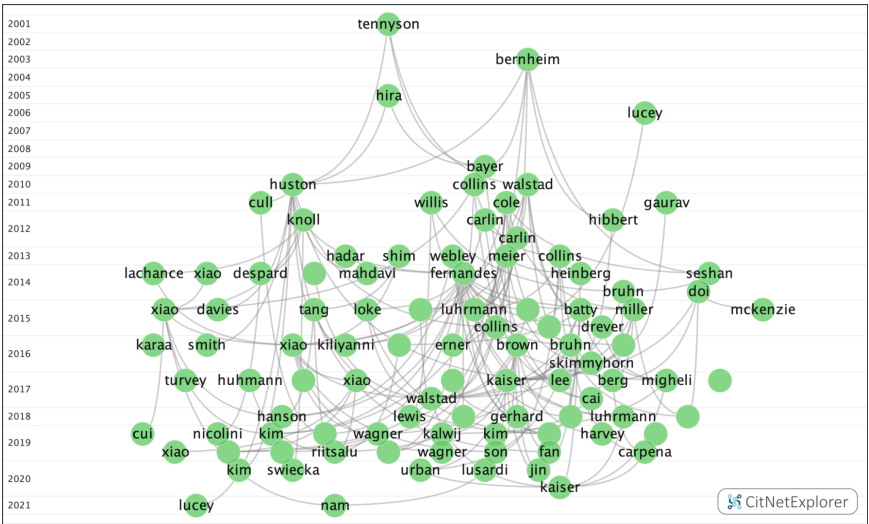


Figure 8. Cluster 2 - Didactic lines

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.

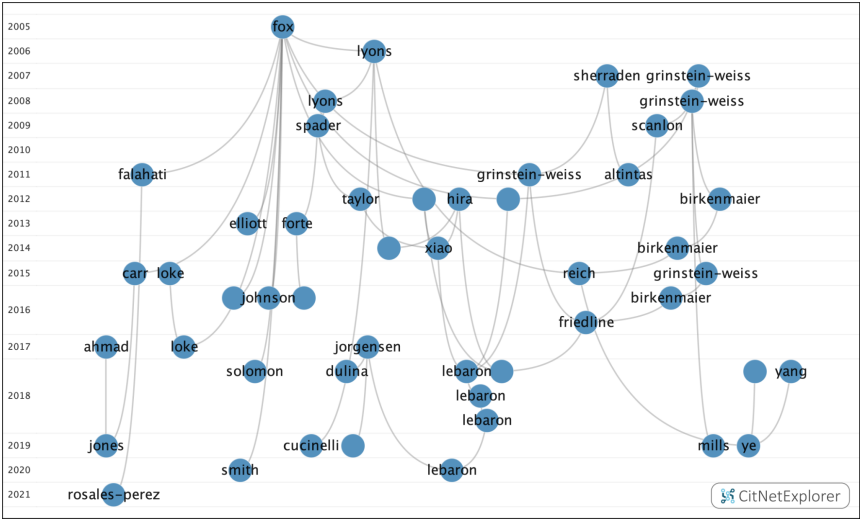


Figure 9. Cluster 3 - Practical lines

The last cluster, although not the most recent, with a time frame between 2007-2021, is the one with less research and covers multidisciplinary themes. Relates the field of financial education philosophically with other areas; it was the only cluster to cover research related to the environmental pillar of sustainability. It is still possible to identify that the papers dealing with the environmental pillar do not directly link them. And yet assume weak citation links with other articles, as is the case with Helm *et al.* (2019) that covers the social and environmental pillar and Anderson *et al.* (2013), that manage to relate the three pillars.

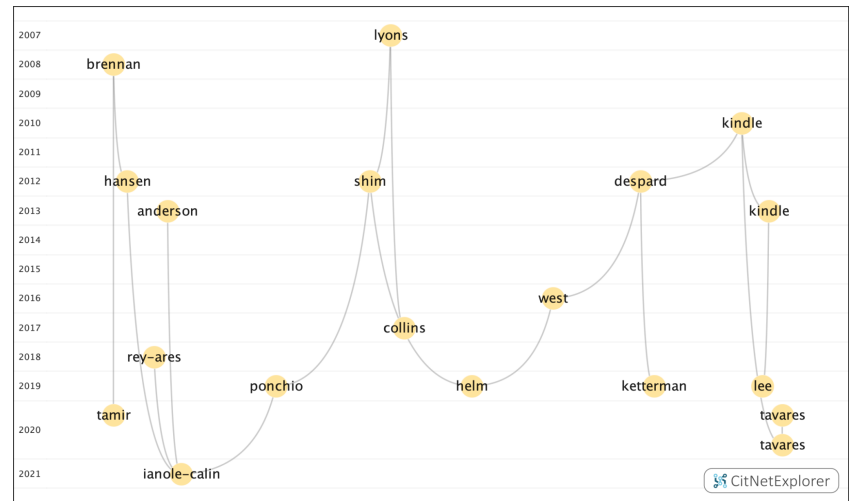


Figure 10. Cluster 4 - Philosophical and multidisciplinary lines

In general, the number of publications involving financial education and sustainability has been gradually increasing each year, with an average of  $\approx 25$  publications per year between

2011-2016, rising to  $\approx 60$  between 2017-2021, growing more than 100%. The largest concentration of productions comes from institutions in the United States that hold  $\approx 46\%$  of 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.

## **6. 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

- Adams, G. & Rau, B. (2011). Putting Off Tomorrow to Do What You Want Today Planning for Retirement. *The American psychologist*. 66. 180-92. DOI: 10.1037/a0022131.
- Aleksandrova, O.A., Alikperova, N.V., Vinogradova, K.V., Nenakhova. Yu.S. (2020). Conceptual approaches to creating the preconditions for the effective financial education of the Russian population. *Economic and Social Changes*. Vologda vol. 13, no. 4, pp. 169–185. DOI: 10.15838/esc.2020.4.70.10



- Atkinson, A., McKay, S., Collard, S. & Kempson, E. (2007). Levels of Financial Capability in the UK. *Public Money & Management*. 27. 29-36. DOI: 10.1111/j.1467-9302.2007.00552.x.
- Atkinson, A. & Messy, F. (2011). Assessing financial literacy in 12 countries: an OECD/INFE international pilot exercise. *Journal of Pension Economics and Finance*, 10, pp 657-665 DOI: 10.1017/S1474747211000539.
- Babiarz, P & Robb, C. (2014). Financial Literacy and Emergency Saving. *Journal of Family and Economic Issues*. 35. DOI: 10.1007/s10834-013-9369-9.
- Belekhova G. V., Kalachikova O. N. (2018). "Live and learn": conceptual discourse on people's financial literacy. *Economic and Social Changes: Facts, Trends, Forecast*, vol. 11, no. 6, pp. 143-162. DOI: 10.15838/esc.2018.6.60.9
- Bernheim, B. D. (1995). *Do Households Appreciate Their Financial Vulnerabilities? An Analysis of Actions, Perceptions, and Public Policy*. Tax Policy and Economic Growth, Washington, DC: American Council for Capital Formation, 1995a, pp. 1-30.
- Bernheim, B. D. (Eds. Olivia S. Mitchell and Sylvester J. Schieber) (1998). *Financial Illiteracy, Education, and Retirement Saving*. Living with Defined Contribution Pensions, University of Pennsylvania Press, Pension Research Council, the Wharton School pp. 38-68.
- Borokhovich, K., Bricker, R., Zivney, T., & Sundaram, S. (1995). "Financial Management" (1972-1994): A Retrospective. *Financial Management*, 24(2), 42-53. doi:10.2307/3665533
- Boshara, R., Gannon, J., Mandell, L., Phillips, J. & Sass, S. (2010). Consumer trends in the public, private, and nonprofit sector. Retrieved from National Endowment for Financial Education: *The Quarter Century Project: 25 Years of Research in Financial Education*. Recovered from <http://assets.newamerica.net/sites/newamerica.net/files/policydocs/BosharaetalNEFEConsumertrends.pdf>
- Bruhn, M., Leão, L., Legovini, A., Marchetti, R. & Zia, B. (2016). The Impact of High School Financial Education: Evidence from a Large-Scale Evaluation in Brazil. *American Economic Journal: Applied Economics*. 8. 256-295. 10.1257/app.20150149.
- Bucher-Koenen, T. & Lusardi, A. (2011). Financial literacy and retirement planning in Germany. *Journal of Pension Economics and Finance*, 10, pp 565-584. 10.1017/S1474747211000485.

- Calderón, G., Cunha, J. M. & De Giorgi, G. (2013). Business Literacy and Development: Evidence from a Randomized Controlled Trial in Rural Mexico. *National Bureau of Economic Research*. Working Paper 19740: <http://www.nber.org/papers/w19740>.
- Cole, S., Sampson, T. & Zia, B. (2011) Prices or Knowledge? What Drives Demand for Financial Services in Emerging Markets?. *The Journal of Finance*. Vol. 66, No. 6, DOI: 10.1111/j.1540-6261.2011.01696.x
- Collins, J. M. & O'Rourke, C. M. (2010). Financial Education and Counseling - Still Holding Promise. *Journal of Consumer Affairs*, 44: 483-498. DOI: 10.1111/j.1745-6606.2010.01179.x
- Cordeiro, N. J. N., Costa, M. G. V & Silva, M. N. da. (2018). Educação financeira no Brasil: uma perspectiva panorâmica. *Ensino da Matemática em Debate* (ISSN: 2358-4122), São Paulo, v. 5, n. 1, p. 69 – 84.
- Costa, C. A. S. & Loureiro, C. F. B. (2013). Educação Ambiental Crítica e Interdisciplinaridade: A Contribuição da Dialética Materialista da Determinação Conceitual. *Revista Terceiro Incluído*. ISSN 2237-079X NUPEAT–IESA–UFG, v.3, n.1, Jan./Jun., 2013, p. 1–22, Artigo 34 DOI: 10.5216/teri.v3i1.27316
- Cull, M. & Whetton, D. (2011). University Students' Financial Literacy Levels: Obstacles and Aids. *The Economic and Labour Relations Review*. Vol. 22 No. 1, 99–114, DOI: 10.1177/103530461102200106.
- Dickmann, I., Ruppenthal, S., Schlickmann, C. & Nagorsky, T. (2018). Professional Profile of Teachers of Financial Education and Sustainability in The Municipal Teaching Network of Chapecó-SC. *Revista Tempos e Espaços em Educação*. 11. 313. DOI: 10.20952/revtee.v11i27.7199.
- Fernandes, D., Lynch, J. G. Jr. & Netemeyer, R. G. (2014). Financial Literacy, Financial Education and Downstream Financial Behaviors (full paper and web appendix) (January 6, 2014). *Forthcoming in Management Science*. Available at SSRN: <https://ssrn.com/abstract=2333898>
- Fox, J., Bartholomae, S., & Lee, J. (2005). Building the Case for Financial Education. *The Journal of Consumer Affairs*, Vol. 39, No. 1. DOI: 10.1111/j.1745-6606.2005.00009.x.
- Grinstein-Weiss, M., Guo, S., Reinertson, V. & Russell, B. (2015). Financial Education and Savings Outcomes for Low-Income IDA Participants: Does Age Make a Difference?. *Journal of Consumer Affairs*. Wiley Blackwell, vol. 49(1), pages 156-185, March. DOI: 10.1111/joca.12061.

- Haskins, R. (2001). Effects of welfare reform on family income and poverty. In R. Blank & R. Haskins (Eds.), *The new world of welfare* (pp. 103–136). Washington, DC: Brookings Institute Press.
- Hastings, J., Madrian, B., & Skimmyhorn, B. (2013). Financial Literacy, Financial Education and Economic Outcomes. *Annual Review of Economics*. 5:347–73. DOI: 10.1146/annurev-economics-082312-125807
- Helm, S., Serido, J., Ahn, S., Ligon, V. & Shim, S. (2019). Materialist values, financial and pro-environmental behaviors, and well-being. *Young Consumers*. ahead-of-print. 10.1108/YC-10-2018-0867.
- Hibbert, A. M., Lawrence, E. & Prakash, A. (2012). Can Diversification be Learned?. *Journal of Behavioral Finance*. 13. 38-50. DOI: 10.1080/15427560.2012.654547.
- Hira, T. K. & Loibl, C. (2005). Understanding the Impact of Employer-Provided Financial Education on Workplace Satisfaction. *The Journal of Consumer Affairs*. Vol. 39, No. 1, DOI: 10.1111/j.1745-6606.2005.00008.x.
- Hira, T. (2010). The nefc quarter century project: implications for researchers, educators, and policy makers from a quarter century of financial education. Retrieved from National Endowment for Financial Education: The Quarter Century Project: 25 Years of Research in Financial Education. Recovered by <http://docplayer.net/28069260-The-nefc-quarter-century-project-implications-for-researchers-educators-and-policy-makers-from-a-quarter-century-of-financial-education.html>.
- Huston, S. J. (2010), Measuring Financial Literacy. *Journal of Consumer Affairs*, 44: 296-316. <https://doi.org/10.1111/j.1745-6606.2010.01170.x>
- Jackson, T. (Ed. José Eduardo Mendonça). (2013). *Prosperidade sem crescimento: Vida boa em um planeta finito* (1<sup>st</sup> Ed. - Original work published in 2009). São Paulo: Ed. Abril.
- Jiang, S. S & Dunn, A. L. F. (2012). New evidence on credit card borrowing and repayment patterns. *Economic Inquiry*. DOI: 10.1111/j.1465-7295.2012.00456.x
- Johan, I., Rowlingson, K. & Appleyard, L. (2020). The Effect of Personal Finance Education on The Financial Knowledge, Attitudes and Behaviour of University Students in Indonesia. *Journal of Family and Economic Issues*. 1-17. DOI: 10.1007/s10834-020-09721-9.
- Kallis, G. & Norgaard, R. B. (2010). Coevolutionary ecological economics. *Ecological Economics*. 69(4):690-699. DOI: 10.1016/j.ecolecon.2009.09.017.

- Kindle, P. A. (2010). Student Perceptions of Financial Literacy: Relevance to Practice. *Journal of Social Service Research*. 36:5 470-481. DOI: 10.1080/01488376.2010.510951.
- Koseoglu, M. A. (2016). Growth and structure of authorship and co-authorship network in the strategic management realm: Evidence from the Strategic Management Journal. *Business Research Quarterly*, 19, p. 153-170. DOI: 10.1016/j.brq.2016.02.001
- Kumar, K. & Prakash, A. (2019). Developing a framework for assessing sustainable banking performance of the Indian banking sector. *Social Responsibility Journal*, Vol. 15 No. 5, pp. 689-709. DOI: 10.1108/SRJ-07-2018-0162
- Leonard, T. C. (2008). Richard H. Thaler, Cass R. Sunstein, Nudge: Improving decisions about health, wealth, and happiness. *Constitutional Political Economy*. 19, 356–360. DOI: 10.1007/s10602-008-9056-2
- Lin, X.; Bruhn, A. & William, J. (2019). Extending financial literacy to insurance literacy: a survey approach. *Accounting & Finance*, G22, D14, A23 DOI: 10.1111/acfi.12353
- Loke, Y. J. (2017). Financial Vulnerability of Working Adults in Malaysia. *Contemporary Economics*. D14; D91. DOI: 10.5709/ce.1897-9254.237.
- Lusardi, A. & Mitchell, O. S. (2011). Financial Literacy around the World: An Overview. *National Bureau of Economic Research Working Paper Series*. DOI: 10.3386/w17107
- Mandell, L. & Klein L. S. (2009). The Impact of Financial Literacy Education on Subsequent Financial Behavior. *Journal of Financial Counseling and Planning*, Vol. 20, No. 1, 2009, Available at SSRN: <https://ssrn.com/abstract=2224231>
- Muñoz, J. G. P. (2019). Governance of the Global Financial System: The Legitimacy of the BCBS 10 years after the 2008 Crisis. *Journal of International Economic Law*. 2019, 22, 247–260. DOI: 10.1093/jiel/jgz011
- Orbanova, D. & Velichova, L. (2013). Importance of Entrepreneurship and Financial Literacy in the Socio-Economic Progress and Personal Growth of Young People in the Slovak Republic. *Sociológia*. 45. 470-488.
- Organization for Economic Cooperation and Development (2005). *Recommendation on principles and good practices for financial education and awareness*. Recovered from <http://www.oecd.org/dataoecd/7/17/35108560.pdf>
- Organization for Economic Cooperation and Development (2011). *International gateway for financial education*. Recovered from [http://www.oecd.org/pages/0,3417,en\\_39665975\\_39667032\\_1\\_1\\_1\\_1\\_1,00.html#Why](http://www.oecd.org/pages/0,3417,en_39665975_39667032_1_1_1_1_1,00.html#Why).

- Pangestu, S. & Karnadi, E. B. (2020). The effects of financial literacy and materialism on the savings decision of generation Z Indonesians. *Cogent Business & Management*. 7:1, 1743618. DOI: 10.1080/23311975.2020.1743618
- Pare, G., Trudel, M., Jaana, M., & Kitsiou, S. (2015). Synthesizing information systems knowledge: A typology of literature reviews. *Information & Management* 52 183–199. DOI: 10.1016/j.im.2014.08.008.
- Pare, G., Tate, M., & Johnstone, D. (2016). Contextualizing the twin concepts of systematicity and transparency in information systems literature reviews. *European Journal of Information Systems*. doi:10.1057/s41303-016-0020-3
- Phillips, K. R. (2001). The earned income tax credit: Knowledge is money. *Political Science Quarterly*, 116, 413–424. DOI: 10.2307/798023.
- Rockström, J., Steffen, W., Noone, K., Persson A., Chapin, F. S., Lambin, E., Lenton, T. M., Scheffer, M., Folke, C., Schellnhuber, H. J., Nykvist, B., De Wit, C. A., Hughes, T., Van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P. K., Costanza, R., Svedin, U., Falkenmark, M., Karlberg L., Corell, R. W., Fabry, V. J., Hansen, J., Walker, B., Liverman, D., Richardson, K., Crutzen, P. & Foley, J. (2009). Planetary Boundaries: Exploring the Safe Operating Space for Humanity. *Ecology and Society*. 14(2): 32.
- Salter, A. W. (2016). Leonidas Zelmanovitz, The Ontology and Function of Money: The Philosophical Fundamentals of Monetary Institutions. *The Review of Austrian Economics*. 30(3), 397–400. DOI: 10.1007/s11138-016-0342-3
- Sakata, I.; Sasaki, H.; Akiyama, M.; & Sawatani, Y. (2013) Bibliometric analysis of service innovation research: identifying knowledge domain and global network of knowledge. *Technological Forecasting & Social Change*, 80,1085-1093. DOI: 10.1016/j.techfore.2012.03.009
- Tamir, E. & Davidson, R. (2019). Inspiration In Surprising Places: Searching For a Civic Dimension in Financial Literacy. *British Journal of Educational Studies*, DOI: 10.1080/00071005.2019.1642444
- Tennyson, S. & Nguyen, C. (2001). State Curriculum Mandates and Student Knowledge of Personal Finance. *Journal of Consumer Affairs*. 35. 241-262. 10.1111/j.1745-6606.2001.tb00112.x.
- Van Eck, N. J., and Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, 84, 523-538. DOI: 10.1007/s11192-009-0146-3.

- Van Eck, N. J., and Waltman, L. (2014). CitNetExplorer: a new software tool for analyzing and visualizing citation networks. *Journal of Informetrics*, 8, 802-823. DOI: 10.1016/j.joi.2014.07.006.
- Van Eck, N. J., and Waltman, L. (2017). Citation-based clustering of publications using CitNetExplorer and VOSviewer. *Scientometrics*, 111, 1053-1070. DOI: DOI:10.1007/s11192-017-2300-7
- Victor, P. (2010). Questioning economic growth. *Nature*. 468, 370–371 (2010). DOI: 10.1038/468370a.
- Willis, L. E. (2011). The Financial Education Fallacy. *American Economic Review*. 101 (3): 429-34. DOI: 10.1257/aer.101.3.429
- Yang, S.; Ishtiaq, M. & Anwar, M. (2018). Enterprise Risk Management Practices and Firm Performance, the Mediating Role of Competitive Advantage and the Moderating Role of Financial Literacy. *Journal of Risk and Financial Management*. 11, 35; DOI: 10.3390/jrfm11030035