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An Assessment Tool to Identify the Financial Literacy Level of Financial Education Programs Participants' Executed by Ecuadorian Financial Institutions

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Abstract: Due to the lack of a tool assessing the effectiveness of Financial Education Programs (FEP) imparted by the financial institutions (FI) in Ecuador by mandate, this research proposes and validates a scale to evaluate the Financial Literacy (FL) level of 314 participants (15–50 years old) after attending an FEP. The final 18-item FL scale, compounded with Financial Attitude, Financial Knowledge, and Financial Behavior dimensions, is reliable and robust according to the Exploratory and Confirmatory Factor Analysis. The average score for FL is 76 out of 100 points. The youngest scored the lowest, and the FI employees the highest. This contribution fulfills a needed FL scale to accurately measure the efforts of FI spreading the FE. It serves as a stepping stone for further research reconfirming its validity and applying the proposed FI's FL scale as a pre–post FL evaluation.

Keywords: financial literacy; financial education program; financial institutions; scale validation

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1. Introduction

In recent years, the topic of financial literacy (FL) has had a growing interest, and it has become a major concern for governments on account of the economic and financial crisis of 2008, the growth of banking and insurance activity, and the pressure on consumer marketing [1]. Several studies around the world show the effect of FL on various relevant issues including savings and retirement planning [2–9]. Furthermore, FL has also been shown to be an important factor in the topics of stock market participation and investment decision-making [10–13]. A lack of FL can lead to poor saving and spending habits, the misuse of credit cards, and terrible investment choices, whereas the opposite entails that financially literate individuals are better equipped to make financial decisions, build a secure financial future, and reach their own life goals, improving economic stability [14].

FL is fundamental to making effective decisions across a range of financial contexts, improving financial well-being for individuals and society, and enabling participation in economic life. It is defined as the combination of financial awareness, knowledge, skills, attitudes, and behaviors. FL is not the same as financial education [15]. Financial education, on the other hand, refers to the process of improving the understanding of financial products, and the concepts and risks associated with achieving financial well-being. This process may include instruction and being provided with the information necessary for better decision-making [16].

There are efforts in place to respond to the issue of FL in most countries. Latin America and the Caribbean (LAC) call for Financial Education Programs (FEP) to counteract the FL issue, though there is scarce research focusing on this topic [17]. Financial education is the

main method of intervention whose expected result is to increase FL. Most studies aiming to impact FL levels design their interventions around financial education definitions [18–20]. These interventions show that FEPs have generated a positive impact. For example, the use of video vignettes on key financial decisions as an intervention to increase FL in Ecuador yielded positive results after a four-week long intervention [21]. In Brazil, similar results were reported from personal finance courses [22], and the effects of formal and business education [20].

In Mexico, the National Financial Education Committee was created in 2011 with a strategy in place to guide the country's efforts to promote financial well-being [23]. In Brazil, a National Strategy for Financial Education (ENEF) was created in 2010 to promote financial education actions free of charge and without commercial interest [24]. Similarly, in Chile, the ENEF was created in 2017 [25]. In Colombia, the Banking and Financial Institutions Association of Colombia (Asobancaria), establishes that FI under its regulations must provide adequate information or training regarding the financial products and services they offer, to develop skills and confidence that allow informed decision-making [26].

In the Ecuadorian case, a resolution instated by the Superintendency of Banks in 2013 mandated that all entities under its control must develop FEPs [27]. The FEP target group is composed of high school students, university students, and adults in general. An example of this is the 'Tus Finanzas' FEP which consists of a group of FIs conducting training to increase the financial capabilities of Ecuadorian society since 2014 [28]. However, there is no common framework to develop these programs. Until 2018, 12 out of 29 regulated institutions were providing both in-person and online FEPs, nine institutions offered only online programs, and one had only in situ classes [29].

Despite the efforts through FEPs, there is nonexistent control and no scale designed to evaluate these programs. This evaluation of the existing FEPs represents a fundamental first step for policymakers and interested parties to follow the necessary actions and prevent poor decision-making and improve financial well-being. In Ecuador, the scientific literature shows the design and validation of an FL scale, focused on Key Financial Decisions among university students [30], but nothing referring to the evaluation of the FI efforts in enhancing Ecuadorian FL.

Scales intended to measure FEPs are scarce in the LAC area [17]. More specifically, in Ecuador, there is a lack of customized scales to monitor the FEPs' impacts or the effects achieved. We are left with the uncertainty of not knowing if these programs are effective in their purpose of increasing FL levels. Being heterogeneous, an evaluation tool should be defined according to the indicated contents and the general guidelines of the FEPs' development.

Though there are scales that have been used worldwide and have been incredibly useful to make comparisons across different countries, including the OECD/INFE Toolkit for measuring FL and financial inclusion survey in 2018, the S&P FL survey in 2020, and The Test of FL survey in 2017 [31–33], among others, it is important to consider the heterogeneity of each country's framework [34]. FL is not a universal concept that can be measured across nations using the same questions, and therefore, questions should be adapted to a country's specificities [34]. Thus, to evaluate the FEPs of FIs in the specific context of Ecuador, we have decided to propose a different evaluation method.

In trying to fill this research gap, our study investigates the FL levels of the participants of FEPs imparted by FIs in Ecuador, improving the understanding of measurement scales in FL. The importance of this analysis lies in its potential for the improvement of FEPs, considering these new findings. In this study, we aim to make an exploration of the following research question: how financially literate are the participants of FEPs executed by Ecuadorian FIs? To answer this thoroughly, we define the following objectives:

First, we will propose the design of a scale to measure FL, using data from surveyed participants after receiving training from an FEP in Ecuador. Then, we will assess the validity and reliability of the proposed FL scale for FIs in Ecuador using Confirmatory Factor Analysis (CFA). Later, we will identify the FL levels of the participants after the

intervention to characterize their performance in the Ecuadorian context and find potential determinants of the FL score using the sociodemographic data. Lastly, we will characterize the participants' preferences in the context of the banking products and services.

This paper is divided into five sections. Section 2 explains the conceptual basis of FL. Section 3 describes the sample, data collection process, and other details of the research design. Section 4 shows the statistical results. Section 5 discusses the findings. Lastly, Section 6 presents the main conclusions.

2. FL Conceptual Basis

2.1. FL and Its Dimensions

Throughout different studies, different interpretations of FL have been given. Notoriously, FL is understood as encompassing two main constructs or components: financial knowledge and the financial ability to properly apply this knowledge [35]. By recognizing that an individual may have financial knowledge but not have the ability to implement it, they would still be considered financially illiterate. To others, FL refers to the ability to process information about economic and financial concepts, for, without an understanding of these concepts, people will not be well-equipped in the financial decision-making processes [36]. The financial decisions faced by individuals in their day-to-day life include saving, investing, borrowing, and more. The OECD's [37] interpretation of FL regards three well-defined constructs: Financial Knowledge (FK), Financial Behavior (FB), and Financial Attitude (FA). Similarly, these same dimensions are considered when FL is referred to as "A combination of awareness, knowledge, skill, attitude, and behavior necessary to make sound financial decisions and ultimately achieve individual financial well-being" [38]. More recent studies are mostly based on previous definitions, especially the OECD, and encompass knowledge about financial topics, along with the ability to make sound financial decisions [39] such as the appropriate use of credit [40]. Other topics included in the FL definition pertain to the knowledge related to compound interest rates, risk management [41], budget management, money control, period planning, and the choice of financial products [42].

Based on these main definitions, there are three main dimensions of FL vastly regarded in the literature, with knowledge being the first one. For a person to be considered financially knowledgeable, one must have a solid understanding of key financial concepts, as well as numeracy skills whose application is essential in financial situations. These key concepts include simple and compound interest, risk and return, and inflation [38,43]. In a 2015 study, it was found that financial concepts may be more easily understood if one is proficient in math. Therefore, it is suggested that developing strong math knowledge and ability in young people may lead to better FL in adults in some countries [32]. Moreover, the correlation between FL and education is shown when the results of individuals with a university education or higher present better FK scores [44]. The link between FL and education should be clarified, since FK is a consequence of FEPs, and these are not the same [45].

FB is arguably the most important element of FL, as it has a direct impact on financial well-being, and is a determinant of FL [36,43]. Behaviors such as expenditure budgeting and securing a financial safety net are considered to indicate high levels of FL, while behaviors such as excessive credit use can indicate the contrary. An assessment of different studies on FL suggests a causal relationship that goes from financial knowledge to behavior [36]. They state that FL, which makes more of an emphasis on knowledge, influences financial decision-making. This has been studied using both experimental approaches, and instrumental variables [46–50].

Regarding the FA component, there is an important relationship between attitudes and the resulting FL. Attitudes encompass the knowledge, objective financial information, and the emotions associated which would result in an individual's observed behaviors [51]. The FA construct aims to measure how individuals self-evaluate their financial management abilities [52]. FA's relevance is highlighted by the following quote "If people have a rather

negative attitude towards saving for their future, for example, it is argued that they will be less inclined to undertake such behavior" [38]. This also suggests a relationship between behavior and attitude. The FA dimension considers a disjunctive between short-term gratification and long-term security in money matters [43], measuring attitudes toward planning for the future.

All previous research accentuates the importance of FK, in conjunction with the behavior and attitudes necessary to show improvement in their financial well-being, which is the goal [53–58].

These three components of FL (FK, FB, and FA) have become a common framework and have been used for multiple studies regarding the proposal of scales that measure FL.

This research proposes to test the three constructs (FK, FB, and FA) and their possible representative influences on FL to execute it in the Structural Equation Model (SEM), as it has been developed before [30,59].

2.2. Scales for Measuring FL

The importance of measuring FL has not gone unnoticed. Having such data provides policymakers with information regarding the specific needs and gaps of the population concerning FL. This allows them to provide financial education in the most effective way to the groups of people that need the most assistance [38].

Following their understanding of FL and the proposed dimensions (FK, FB, and FA), the OECD questionnaire proposes one of the most widely used and regarded FL scales. This report consists of a 21-item scale, where the FK score ranges between 0 and 7, the FB score ranges between 0 and 9, and the FA score ranges between 1 and 5. The overall FL score is calculated as a sum of the 21 items, meaning that in this scale, FB contributes the most to the final score [31]. The scale was validated by OECD/INFE experts and used to evaluate adults between the ages of 18 and 79 from 26 different countries. The results indicated an average score across all participating countries of just above 60% [15].

The Test of Financial Literacy is a 45-item test designed to measure the FK of high school students [33]. It was based on the National Standards for FL (Council for Economic Education 2013) which include the following topics: (1) earning an income; (2) buying goods and services; (3) saving; (4) using credit; (5) financial investing; and (6) protecting and insuring financial assets. Its main purpose was to help teachers to assess and improve the quality of personal finance instruction in high schools [60]. This test was validated and proven to be reliable (Cronbach's alphas = 0.87) and presented an average score of 43.48% for high school students. Though it was intended for this age group in the US, several variations have been used in different contexts [61,62].

Another relevant scale in the literature corresponds to the S&P Global FinLit Survey. This survey uses five questions to assess FL, which include fundamental financial topics necessary to make sound financial decisions (risk diversification, inflation, basic numeracy, and interest compounding) [32]. It is universal and applicable to every country, focused on knowledge and numeracy. If people know three out of the four topics, they are considered to be financially literate.

Some results that may be useful for comparisons in FL studies pertain to the OECD, according to whom the minimum average score for FL is 0.6 (60% of answers), approximately 0.71 for FK (71%), 0.6 for FB (or 60%), and 0.6 for FA (or 60%) [15]. Moreover, the S&P Global survey reports a score of around 60% for the most developed economies, while for emerging countries the score barely passed the 50% threshold [32].

The literary review of FL in LAC countries reports that about 50.77% of articles report measurement instruments or scales to evaluate FL in different contexts [17].

A study in LAC countries used a 25-item scale (Likert) to evaluate a sample of university students about FL topics that included savings, budget, credit management (cards and loans), investment, and financial terms. They considered the two dimensions of FK and FB. Their proposed model proved to be reliable (Cronbach's alphas = 0.681) [42]. Similarly, a study about credit card use and behavior evaluated young adults on the three dimensions,

and validated their model obtaining good results (Cronbach's alpha > 0.69), determining the effect of this behavior on financial well-being [63].

Other studies in LAC countries present their scales, as original or variations from previous literature, however, not all of them consider the three dimensions. In Mexico, a 24-item FK scale has proven to be a reliable model (Cronbach's alphas = 0.860) [64]. Another Mexican study focuses on the FK dimension when analyzing students and their perception of financial tools [65]. Similarly, in Chile, a study about the determinants of personal loan total costs obtains a model (Cronbach's alphas > 0.7) through the lens of the knowledge dimension [66].

Several Brazilian studies on FL have designed and validated their scales. A study on FL and the gender gap also agrees with the three-dimensional model and proves the reliability of the scale (Cronbach's alphas = 0.6) [58]. Lastly, "Bolsa Família X" is a study that agrees with the three-dimensional model of FL and shows satisfactory psychometric results (Cronbach's alphas > 0.7) (23-item scale) [67].

Most recently, in Ecuador, a 44-item scale which focuses on Key Financial Decisions among young adults was designed and validated using the same dimensions previously discussed (FK, FB, and FA) [30]. They prove the validity and reliability of their scale with a sample from an Ecuadorian university. Their final model reflects good convergent validity (Cronbach's alpha = 0.855) among other positive statistic values. Their results show an average FL score of 65%. However, it focuses on key financial decisions, for example, retirement planning and the purchase of a house and car, while our proposal intends to evaluate a different set of topics based on the FIs' FEPs under the Superintendency of Banks of Ecuador (SB).

2.3. FEP in Ecuador

A 2020 FL and capabilities study in Ecuador found participants scored 12.2 out of 22 (55%), which was considered a high score, as it is within the Latin American average [68]. However, in a study with evidence from around the world, it was found that only 30% of the Ecuadorian sample was financially literate by correctly answering three out of five questions in the S&P FL Survey [69]. To understand the difference in results between these two studies, it is important to consider that these two are based on different methodologies and consider different criteria since the CAF study measures FL and compares it among Latin American countries while the second study mentioned presents evidence from around the whole world. The relatively deficient FL scores explain the reasoning behind the need for mandated FEPs. The SB issued a regulation asserting that all entities under its control must develop FEPs in favor of clients, collaborators, and the general public [27]. It is also specified that the FEP delivery system can be virtual or in situ to accommodate participants' needs. Additionally, it is stated that they must have evaluation mechanisms in place to certify the approval of the training. The training is free of cost and carried out through various modalities, including in-person financial education workshops and online courses [27], however, the methodologies vary depending on the institution imparting them [70–72]. A study from 2018 analyzed the 29 FIs' FEP performances regulated by the SB, where twelve private banks provide both online and in-person FEPs, nine only provide online FEPs, and one provides a solely in-person FEP [29]. Many of the FIs' FEPs have adapted to technological trends and now use different social media platforms such as Facebook, Instagram, Twitter, YouTube, radio shows, and webinars as channels to deliver their programs. This goes to show that the methodologies and channels through which people are educated vary according to the institution, as there is no specific format or learning delivery method they are required to follow.

In addition, the SB mandates that the main topics to be taught in the programs should include the structure and operation of controlled systems, banking products and services, savings and family budgeting, rights and obligations for the use of debit/credit cards, insurance products, and requirements to access social security benefits, among others specified in the scale design section. However, even when the topics comply with the

regulations, it is shown that usually the focus is on savings and family budgeting [29]. The duration of the FEP is also a heterogeneous factor within programs as there is no required number of hours specified in the resolution. Most FEPs do not indicate the hours taken to complete the program and only around 15% of them indicate the maximum duration of each module which ranges from 4 to 11 h [29]. The target audience follows SB guidelines; however, it has been found that 33.33% of institutions are focused on children and young adults, and 25.93%, are focused on clients and collaborators. Meanwhile, 93.10% of institutions are focused on women [29].

2.4. Sociodemographic Factors in FL

Sociodemographic factors are of relevance when studying FL scores [38,73,74]. Previous studies show an overwhelming difference between the FL levels of women and men, with women presenting lower scores. This trend is prevalent in important studies throughout the years and different places. In a study of FL around the world, it was shown that in most cases, women are less financially literate than men [73]. These results are consistent among countries according to international studies [38]. In Mexico, the three-question FL test encountered this same trend [40]. Others reiterate the same pattern [58,75,76]. This may be because men are more likely to relate money with power and social desirability [77], while women tend to have more passive and conservative attitudes [58].

Many researchers have found a strong correlation between FL and age, these relations being shaped by an inverted U [40,46,73]. This means that the levels of FL are lower in younger and older people, reaching a peak around middle age. While young people lack the experience that aids in acquiring FL, cognitive impairment might explain FL's decrease in older adults, which is why FL peaks in middle age [46]. As shown in a cross-sectional study where middle-aged adults made better decisions regarding the use of credit [46], the research determined that 53 years old was the age with minimized cost.

However, it is important to consider that high variability in FL has been found when it comes to young and old individuals [73]. For example, a study in Pakistan universities shows a significant FL difference between age groups among students, peaking at 26 in their sample [78].

Studies show that individuals with higher educational levels score better on FL tests [73], which is why FEPs are being applied to individuals as early as high school and during undergraduate programs [62,79–81]. A higher completed educational level is positively related to the probability of answering an inflation-related question correctly [82]. Similarly, a significant difference of 20 percentage points in FK was found between people who attended college and those who only graduated high school [75]. Educational level influences FL, possibly through its association with other factors, for example, math skills, age, and income [69]. This is confirmed by researchers who have found a link between saving behaviors and the educational levels of subjects [83], as well as a more positive FA for more educated individuals [84]. For example, people with higher educational attainment probably have more income which increases the incentive to correctly manage their finances.

In terms of occupation, it has been shown that individuals who are working show a higher level of FL than those who do not work [73], which may be a result of FEPs at the workplace or experience and skills collected at the job, as knowledge accumulates over time [85]. Regarding entrepreneurs, several studies point to a low level of FL among microentrepreneurs [86]. Similarly, researchers have found that the higher the gross profit ratio of the enterprise, the better the FL scores obtained by entrepreneurs, concluding that microentrepreneurs score worse than those of bigger firms [87]. In Thailand, among a sample of 18 small restaurants, it was found that about 75% of microentrepreneurs show low levels of FK and risk business failure [88]. However, it has been shown that self-employed individuals have better FL scores, compared with those in traditional employment [89,90].

Regarding marital status, several studies have investigated its relationship to FL levels. Those who are married are more likely to be financially literate than those who are single,

since married people are more likely to have experience with financial decision-making [91]. Similarly, it was determined that single women were significantly less likely to answer the FL test favorably, than those with a partner [74].

As for the area of residence and its relation to FL, it has been found that urban area residents present higher FL levels as shown in the Russian case study about retirement planning [92]. Rural areas may show lower levels of FL, due to decreased access to resources such as technology [93], and lower educational and income levels [74]. Similar results were encountered in the United States, where they found FL level differences according to geographic location [94]. The Mexican study regarding FL and the use of credit cards showed a difference in the FL score for different regions of the country [40]. Germany [74] and Italy present similar results [95].

Based on the above studies, the three following state hypotheses will help to contrast our results with the conceptual framework:

H1. *Participants present an FL level above the one presented by the OECD.*

H2. *The average FL, FK, FB, and FA scores of participants significantly differ between groups.*

H3. *The average FL scores of the participants were significantly different between the categories of five sociodemographic factors (Gender, Age, Marital status, Educational level, and Occupation).*

3. Research Design

3.1. Sample

The research is based on one of the Ecuadorian financial institution programs collaborating for this research purpose. The FI's goal was to provide training for approximately 1800 participants classified into three groups: Youth (less than 17 years old), Young Adults (18–24 years old), and Adults (25–65 years old). These segments were considered as a reference taken from a resolution set by the SB [27]. The participants were categorized into 4 subgroups: High-school students (HS), Company employees -public/private- (CE), General public (GP), and financial institution employees (FIE). Although a total of 1775 people from the 4 subgroups were registered, some did not show up and did not comply with the FEP. Only 1723 people received the training through one of two modalities: in situ and online.

From the 1723 trained people, a representative sample of 314 people was obtained using the stratified random sampling technique with 95% confidence [96]. This technique used the classification of the 4 groups of the population previously defined: HS, n = 117; CE, n = 96; GP, n = 54; and FIE, n = 47. Women had greater participation at 51%; students between 15 and 20 years old were the most numerous strata to participate at 37%. A total of 43% of the 314-person sample represents clients of the FI.

The study was conducted in the Guayas province of Ecuador. The 314 participants were from four cantons: Guayaquil (n = 305), Durán (n = 5), Daule (n = 2), and Milagro (n = 2). It should be noted that all participants come from the urban areas.

3.2. Data Collection

First, it is necessary to recognize that the FI's FEP execution is in the in-house format. Mainly, the FI's FEP participants are the FI's clients (individuals or institutions), for example, schools, companies, and the general public are participants of these FEPs. Nevertheless, the approach for institutional participants requires a formal procedure accomplishment. As an example, for educational institutions (schools, high Schools, etc.), the FI offer and send a request to the leading authorities of the educational institutions with the FEP's contents and schedule, to offer the FEP training to their community. The acceptance to participate in the FI's FEP requires the educational facilities and logistic considerations agreements.

For the general public, the press, radio stations, and social networks serve as channels to invite participants to be part of the FI's FEP. The general public interested in the FI's FEP must be enrolled at the FI's registration points.

No previous financial background is needed to join the FI's FEP; the requirement is to be interested in learning.

The FI's FEP is delivered in 2 different modalities. HS and CE groups attended the training in the 'on-site' modality inside the banks' premises, whereas the GP and FIE received the training online through a virtual platform. However, some participants from the GP group also chose the workshop on-site.

The FI's FEP consists of a 2-h educational session, and the proposed scale has been applied as post-evaluation to offer the validity and reliability test. Whether on-site or online, the participants fulfill the evaluation at the end of the last session.

3.3. Informed Consent

All participants of the workshop/training were aware that an evaluation is part of the FI's FEP training experience. This study was aligned with the Declaration of Helsinki and received approval from the institutional authorities of ESPOL Polytechnic University [97]. At the beginning of the session, The participants received a brief statement explaining that the information provided would be used solely for academic purposes, maintaining maximum confidentiality. By remaining in the place for the training, and by signing the form, they confirmed their participation agreement (informed consent) as voluntary and anonymous. They also received the senior researcher's contact information for any current or further support concerning this study.

3.4. Scale Design

The scale design was based on the financial dimensions, and the FEP content related to the ten main subjects established by the SB for all Ecuadorian FIs. These topics were categorized on two different axes.

The axis for all Controlled Systems includes:

- Structure, concepts, actors, and operation of controlled systems;
- Financial planning, saving, and preparation of a family budget;
- Rights and obligations contained in the "Code of Rights of the User of the Financial System";
- Role of the Superintendency of Banks;
- Administration, associated risks, rights, and obligations of credit operations;
- Forms and legal figures established to exercise their rights and claims both within the controlled entity and in public bodies.

The axis of Public and Private Financial System includes:

- Administration, handling, use, rights and obligations, and associated risks of the products offered by the controlled system, such as savings books, current accounts, and use of checks, term deposits, credits, and credit cards, among others;
- Administration, management, use, rights and obligations; and risks associated with the financial services offered, such as debit cards, ATMs, electronic banking, drafts and transfers, and remittances, among others;
- Insurance related to the products offered by the controlled entities, especially about general information on insurance, the rights and obligations of the insured, the risks covered and insurance exclusions, the insured amounts, and the process, requirements, and deadlines to make claims in the event of the loss, among others;
- Use of transactional channels.

According to Appendix A, the items considered in the scale are from different authors and prestigious organizations. Four items are from G20/OECD INFE Core Competencies Framework on FL for Adults [98], four items are from OECD/INFE Core Competencies Framework on FL for Youth [99], two items are from CAF Cuestionario de medición de capacidades financieras de Argentina [100], one is from OECD/INFE International Survey of Adult FL Competencies [101], one is from CAF Cuestionario de medición de capacidades financieras de Ecuador [102], and one is by author [58]. From a total of twenty items,

twelve were adapted (A), one was copied and labeled with (C), and seven items (35%) were classified as new (N).

The items are classified into three known dimensions: FK, FB, and FA. The FK subscale has ten items (50% from the total) and is categorized into "basic" and "intermediate" questions, each with five items.

The basic knowledge topics include the role of regulatory entities, consumer protection, and distribution channels of financial services. The intermediate knowledge topics include items regarding budgeting and the traits, uses, and applications of financial products and services. For each item, there is a correct option among the six alternatives.

For the two dimensions FB and FA, a Likert scale was used as a non-comparative scaling technique [103].

The FB dimension subscale has five items focused on the topic of savings, control, and insurance [58,98,99,101]. This dimension identifies the behavior of participants in the face of everyday and family situations. The participant is evaluated through a 6-optioned Likert scale (Not applicable, 0; never, 1; almost never, 2; sometimes, 3; almost always, 4; and always, 5).

Regarding the subscale of the FA where it considers aspects of financial issues for correct decision making, it also has 5 items related to transactional channels, savings, and control, among others.

The attitude subscale considers 5 items related to transactional channels, savings, and control, among others. [98–100,102]. This dimension was measured through a Likert scale, each item with 6 options (Not applicable, 0; totally disagree, 1; disagree, 2; indifferent, 3; agree, 4; totally agree, 5).

The FL score is between 0 and 100 points, calculated from the simple average of the three escalated FA, FB, and FK dimensions to 0–100 points: 25 (100) points of FA (5 times 5), 25 (100) points of FB (5 times 5): 10 (100) points of FK (10 times 1).

In Table S1 of Supplementary Materials, the survey model includes 5 sociodemographic variables additional to the items considered for the scale proposal and validation: gender, age, marital status, educational level, and occupation. Lastly, the survey contains 3 items to describe banking clients' preferences. This includes: You perform financial transactions most frequently in: (ATMS, Online, Mobile, prefer not to share); where do you prefer to keep/invest your savings? (Banks, Cooperative/Mutual, Stock Exchange, none of the above, prefer not to share); and what source of information do you feel is most influential when you decide to choose a product or service from FI? (Guidance and advice from third parties, information provided by the financial institution, my own previous experience, prefer not to share).

3.5. Analysis Procedure

To validate the scale, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) have been implemented as methodological processes (See Figure 1). Measurement theory can then be combined with structural theory to fully specify an SEM model [104,105]. The fittest and most effective model is possible with the fit measures, reliability, and convergent validity results [30,34].

Figure 1. Analysis Procedure.

All tests and analyses use the R software [106]. The psych package [107] was used to develop the EFA. The lavaan package [108] and semTools [109] help the CFA models through the Diagonally Weighted Least Squares (DWLS) estimation method with adjustments (WLSMV) [110].

The correlation matrix is an essential step in EFA and CFA to identify deniable items, the correlations are polychoric due to the variable's composition, where negative coefficients are omitted as non-representatives [111].

For EFA, Bartlett's test seeks to determine the representative existence of correlations between the variables [112]. KMO has levels that range between 0 and 1; values that will guarantee the permanence/elimination of items: (below 0.50, unacceptable; 0.50 or above, miserable; 0.60 or above, mediocre; 0.70 or above, middling; 0.80 or above, meritorious; 0.90 or above; marvelous; and 1, perfect) [113]. Since the correlations are of the polychoric type, the most appropriate factor extraction method is to use the Weighted Least Squares (WLS) as it has the advantage of easily handling multiple factors and is asymptotically efficient [114,115]. The parallel analysis allows for determining the approximate number of factors [116]. It is important to apply the appropriate type of rotation to improve the interpretation of factor loadings. The chosen rotation method is oblique since it offers the additional advantage of allowing the estimation of the correlations of the factors [117]. The Promax method is used because it efficiently handles large amounts of data compared with the Oblimin method [118].

Due to the sample size (n = 314), 0.35 is the cut-off value for factor loadings to be representative [104].

Table A1 in Appendix A shows the CFA factor loads for the three subscales.

Concerning the fit measures, the respective cut-off values for relative chi-square/normed, chi-square (χ^2/df) range between 2 and 5; then Goodness of Fit Index (GFI) values $\geq$ 0.95; Comparative Fit Index (CFI) values $\geq$ 0.95; Normed Fit Index (NFI) values $\geq$ 0.95; Tucker–Lewis Index (TLI) values $\geq$ 0.95; Standardized Root Mean Squared Residual (SRMR) values < 0.08; and Root Mean Square Error of Approximation (RMSEA) values < 0.08 [119].

The reliability consists of Cronbach's alpha classified as acceptable, between 0.60 $\leq \alpha <$ 0.70 or above; good, between 0.80 $\leq \alpha <$ 0.90; excellent, 0.90 or above [120]. The omega (ω) values $\geq$ 0.70 [121].

The convergent validity of each construct uses the average variance extracted (AVE) values $\geq$ 0.50 [122,123].

Finally, through SEM and based on theory, three hypotheses are proposed to support the relationships between the constructs and FL Banking found in the CFA [105]. See Figure 1.

To perform the descriptive analysis FL and its dimensions are the continuous variables of interest. The categorical independent variables are groups (HS = 1, CE = 2, GP = 3, and FIE = 4); gender (male = 1 and female = 2); age (between 15 and 20 years old = 1, between 21 and 26 years old = 2, between 27 and 32 years old = 3, and between 33 and 50 years old = 4); marital status (single = 1, married = 2, free union = 3, divorced = 4); educational level (high school = 1, higher technological level = 2, third level, grade = 3, fourth level, postgraduate = 4); occupation (housewife/househusband = 1, public employee = 2, private employee = 3, microentrepreneur = 4, does not apply = 5).

The inferential analysis evaluates the three proposed hypotheses by T-Student [124] with a p-value $\leq$ 0.05. We first test the main assumptions: The normality of the errors uses the Shapiro–Wilk test [125]. The homogeneity of variances uses Levene's test [126]. In addition to Cohen's Test to help determine the magnitudes of the effect sizes in both groups [127]: $|d| <$ 0.20 "insignificant"; $|d| <$ 0.50, "small"; $|d| <$ 0.80 "medium"; otherwise "large". Partial Eta Squared (η_p^2) was used to determine the proportion of the variance attributable to the possible effect [128]: the following classification related to the size effect of the variance: $\eta_p^2 >$ 0.01 "small"; $\eta_p^2 >$ 0.06, "median"; $\eta_p^2 >$ 0.14 "large"; otherwise $\eta_p^2 >$ 0.50 "maximum". Figure 1 illustrates the whole process.

4. Results

4.1. EFA

Verifying the FL scale structured by FA, FB, FK, Bartlett's test (χ^2 (190) = 54,792.16; $p < 0.000$ ***) and KMO (KMO = 0.85) present favorable results. The KMO of each item also exceeds the optimal value of 0.70, except for the item FK9 (FK9 = 0.68).

The factor extraction method used was Weighted Least Squares (WLS). The parallel visualization method shows four factors to fit the FL scale; however, comparing the factorial models based on the structure and fit measures, three factors are most likely the ideal number of factors in this exploratory process. The chosen rotation method by comparing Oblimin and Promax highlights promax with better results is as follows: (χ^2 (133) = 47,428; $p < 0.000$ ***), (SRMR = 0.097, BIC = 46,664). The total variance explained by the three factors is 79%. These are encouraging results regarding the EFA, which allow the development of the CFA.

4.2. CFA

4.2.1. Correlation Matrix Analysis

The correlation matrix of Figure 2 reveals negative relationships (deniable items) that items FK.1 and FK.9 have with the listed items, and positive and strong correlations (undeniable items) FK.2 and FK.3 (r = 0.96), FB.4 and FB.5 (r = 0.94).

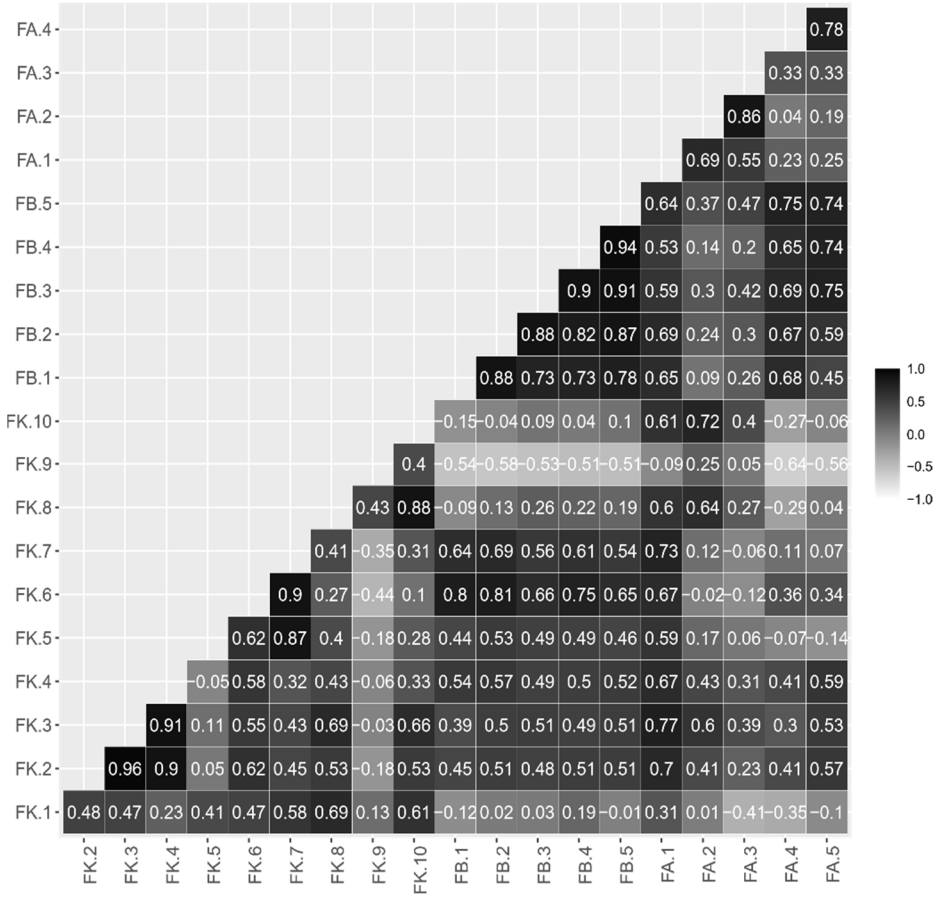

Figure 2. Correlation Matrix.

4.2.2. Fit Measures

Table 1 shows the three tested models with eighteen variables (two omitted in the previous section). The third and selected model fit measures (χ^2 (128) = 1.436,45; $p < 0.000$ ***), GFI = 0.990, CFI = 0.991, NFI = 0.990) include covariances both between latent variables and between items (FK~~FA, FB~~FA, FK~~FB, FK2~~FK3, and FB4~~FB5).

Table 1. Summary of fit measures for the models.

Trial	Model 1	Model 2	Model 3
Applied co-variances	–	FK~~FA FB~~FA FK~~FB	FK~~FA FB~~FA FK~~FB FK2~~FK3 FB4~~FB5
Chi-square (value)	2.062,77	1.450,66	1.436,45
Chi-square (*p*-value)	0.000 ***	0.000 ***	0.000 ***
Degrees of freedom	133	130	128
Chi-square/Degrees of freedom	15.51	11.16	11.22
GFI-Goodness of fit index	0.984	0.990	0.990
CFI-Comparative fit index	0.984	0.991	0.991
NFI-Normed fit index	0.984	0.990	0.990
TLI-Tucker–Lewis's index	0.982	0.989	0.989
SRMR- Standardized Root mean square residual	0.294	0.279	0.278
RMSEA-Root mean square error of approximation	0.313	0.244	0.244

*** $p < 0.001$

4.2.3. Measure of Reliability and Validity of Convergence (Convergent Validity)

Table 2 shows the results of the main measures of the quality of the 18-item scale. FL (α = 0.908) and FB (α = 0.956) are excellent, while FK (α = 0.794) and FA (α = 0.630) are acceptable. FL, FK, FB, and FA exceed the minimum acceptable value of 0.70 in the McDonald's omega first-order reliability indicator.

Table 2. Measures of Reliability and Convergent Validity.

Subscale	Items	α	ω	AVE
FL	18	0.908	0.962	0.745
FK	8	0.794	0.894	0.706
FB	5	0.956	0.962	0.946
FA	5	0.630	0.808	0.605

Notes: α: Cronbach's alpha; ω: McDonald's omega; AVE: Average variance extracted.

The AVE confirms the robustness of these results, with each construct explaining more than 50% of the indicator variable's variance.

4.2.4. Structural Relationships and Hypothesis Testing

The final model remarks the FK construct with the highest coefficient (43%) among the FL dimensions, having slight differences between FA (29%) and FB (28%) as second- and third-order places.

$$FL = (0.43 * FK) + (0.28 * FB) + (0.29 * FA)$$

The positive relation between dimensions (FA, FB, and FK) and FL are supported in the testing process revealed in Table 3.

Table 3. Structural relationships and hypotheses testing (n = 314).

Hypothesis	Path	Estimate	*p*-Value	Decision
H1	FL ← FK	0.43	0.000 ***	Supported
H2	FL ← FB	0.28	0.000 ***	Supported
H3	FL ← FA	0.29	0.000 ***	Supported

*** $p < 0.001$

4.3. Descriptive Analysis and Correlation Analysis

The HS group shows the lower scores in FL and its dimensions; meanwhile, the FIE group leads the high performance in Table 4.

Table 4. The mean and standard deviation FL and its dimensions by Groups.

	FL		FK		FB		FA	
	M	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***
HS	59	0.07	55	0.16	49	0.05	72	0.08
CE	82	0.13	86	0.26	78	0.20	83	0.10
GP	83	0.14	89	0.23	78	0.20	82	0.11
FIE	96	0.02	99	0.03	98	0.02	93	0.03

Table A2 in Appendix A shows high and positive correlations of FL and its dimensions (FL and FK (r = 0.86), FB (r = 0.88), and FA (r = 0.86); and the sociodemographic variables (age, marital status, and educational level) with the strongest relationship between FB and FL.

Table S2 in Supplementary Materials highlights how the FL scores are higher for women in the GP group, though on average men reach the highest score among these groups. Adults (33–50 years old) are the ones with the best overall performance, except for the FIE group where the youngest participants show a slightly higher score. For all the other groups, the youth have the lowest scores.

4.4. Hypotheses

Hypothesis 1 is confirmed. Participants present an FL level above the one presented by the OECD.

The means of FL and the dimensions' score are consistently tested above the 60% benchmark: FL with 76%; FK = 77%; FB = 70%; and FA = 80% from the total sample. The T-Student tested at 95% for FL (t (313) = 16.11; $p < 0.000$ ***); FK (t (313) = 3.91; $p < 0.000$ ***); FB (t (313) = 8.06; $p < 0.000$ ***); and FA (t (313) = 32.55; $p < 0.000$ ***).

Hypothesis 2 is confirmed. The average FL, FK, FB, and FA scores of participants significantly differ between groups.

Table A3 in Appendix A shows significant differences between the four groups and the FL and its dimensions (one-way Anova). The Bonferroni multiple comparisons test highlights two of the six comparisons have no significant average differences (CE = GP and GP = FIE). The remarks are for the Knowledge dimension (F (3310) = 81.76; $p = 0.000$ ***, Cohen's d = 0.44). The average of FIE is the highest among the groups.

Hypothesis 3 is confirmed. The average FL scores of the participants were significantly different between the categories of five sociodemographic factors (Gender, Age, Marital status, Educational level, and Occupation).

Table 5 shows the variables age, marital status, educational level, and occupation with significant differences among their categories. Males show slightly higher performances than females, however, this difference was not representative (t (311) = 0.51, $p = 0.31$, Cohen's d = 0.06).

The groups 27–32 and 33–50 years-old have higher averages between age sections (F (3310) = 147.45, $p = 0.000$ ***, $\eta_p^2 = 0.59$). Married and cohabiting individuals had the highest averages in marital status, (F (3310) = 32.80, $p = 0.000$ ***, $\eta_p^2 = 0.24$). In the educational level, (F (3310) = 169.20, $p = 0.000$ ***, $\eta_p^2 = 0.62$) the higher average is for the third level. Microentrepreneurs and private sector employees in the occupation section reached the highest performance (F (4309) = 180.67, $p = 0.000$ ***, $\eta_p^2 = 0.70$).

Table 5. One-way ANOVA to FL and Sociodemographic factors.

Source	Type II Sum of Squares	df	F-Statistic	*p*-Value	η_p^2	Post Hoc Comparisons-Bonferroni
Age	5.46	3	147.45	0.000 ***	0.59	15–20 < 21–26 15–20 < 27–32 15–20 < 33–50 21–26 = 27–32 21–26 < 33–50 27–32 = 33–50
Residuals	3.83	310				
Marital status	2.24	3	32.80	0.000 ***	0.24	Single < Married Single < Free Union Single = Divorced Married = Free Union Married = Divorced Free Union = Divorced
Residuals	7.05	310				
Educational level	5.76	3	169.20	0.000 ***	0.62	High school < Higher technological level High school < Third level, grade High school < Fourth level, postgraduate Higher technological level < Third level, grade Higher technological level = Fourth level, postgraduate Third level, grade > Fourth level, postgraduate
Residuals	3.52	310				
Occupation	6.50	4	180.67	0.000 ***	0.70	Housewife/Househusband = Public Employee Housewife/Househusband < Private Employee Housewife/Househusband < Microentrepreneur Housewife/Househusband = Does not apply Public Employee < Private Employee Public Employee < Microentrepreneur Public Employee = Does not apply Private Employee < Microentrepreneur Private Employee > Does not apply Microentrepreneur > Does not apply
Residuals	2.78	309				

*** $p < 0.001$

4.5. The Bank's Customer Preferences

The results from the three questions regarding the participants' banking preferences are shown in Table S3 of the Supplementary Materials. Of the participants, 70.06% use e-banking, 21.02% prefer ATMs, and 6.05% selected banking agencies. The results remark their preference to save and invest with banks (78.03%), Cooperatives and Mutual Funds (18.79%), less than 1% (0.64%) in the capital market, including 1.59% with no preferences. In total, 94.27% of participants choose financial products or services based on the financial institutions' information.

5. Discussion

The importance of FL has been vastly regarded in several studies throughout the years since it has a significant impact on the financial well-being of any population across the world [3,69,73]. However, different structures and systems across nations have raised the necessity for FL scales that are tailored to a population's specific traits and economy. In the Ecuadorian case, despite the SB's efforts [27], there are no real evaluation tools to date to measure the results obtained from the mandatory FEPs that are being imparted by the FIs in the country.

The scale design topics were based on the country's regulatory framework which include two main axes: controlled systems and public and private financial systems. The items were mostly adapted from well-known scales vastly used in the scientific literature, along with new items created by the authors. These items correspond to one of the three FL dimensions identified as relevant in the conceptual framework (FK, FB, and FA). Later,

we proved the relationship between FL and its dimensions through the proposed SEM hypothesis [30,129].

The sample of the workshop participants was measured in the three dimensions to obtain and validate the FL scale and finally select a plausible, robust, and reliable model ($\alpha = 0.908$, $\omega = 0.962$, AVE = 0.745). The proposed FL scale shows a Cronbach's alpha of 0.908 indicating excellent reliability and internal consistency of the instrument used. Some scales in the LAC region exhibit good reliability but only consider the knowledge dimension, for example in Mexico (Cronbach's alphas = 0.860) [64], or the study on determinants of personal loan costs (Cronbach's alphas > 0.7) in Chile [66]. Comparing our results with other three-dimensional scales, for example, the gender gap study in 2018 (Cronbach's alphas = 0.6) [58], the Brazilian study in 2016 (Cronbach's alphas > 0.7) [67], and the study on credit card use behavior of young adults (Cronbach's alpha > 0.69) [63], ours seems to show a better internal consistency.

Therefore, the selected FL model for FI in the context of Ecuador consists of three subscales that represent each dimension of FL (FK, FB, and FA). The resulting scale (0.43; 0.28; and 0.29) highlighted the importance of FK. Similarly, the most relevant scales mentioned in the literature considered different weights for each dimension, in most cases focusing more heavily on FK as well [31,33,47].

The results indicate a favorable outcome for the Ecuadorian sample given that the average scores measured by the proposed scale have exceeded the values of the OECD in 2020 [15]. However, it should be noted that this sample had previous preparation due to the training provided by the financial institution which is potentially the reason behind these promising results.

An important observation is that the HS group showed the worst FL results across all considered groups and in all dimensions. This is consistent with the U-Shaped model correlating age and FL [46]. This reveals the need for more didactic programs tailored specifically to these age groups [33,64,65,80,130]. It was verified that the group variable influences FL. As expected, the FIE group performed the best in the FL variable considering their previous knowledge and experience within this field. These better results stem from experience and skills gained through time [85].

Regarding sociodemographic variables, men scored slightly higher than women, however, this difference was not significant. This contradicts the reviewed literature [5,58,67], perhaps because all participants received the FEPs, which could reduce the effect of outside social and cultural factors that differ between genders. The best results for FL were scored by the age groups between 27 and 50 [40,46,73], which agrees with the literature which remarks that middle-aged individuals are the most financially literate due to their life experience and being at an age before cognitive decline [46]. Married and cohabitating individuals present the best FL results among the marital status groups concurring with the available literature [74,91]. This may be explained by the greater likelihood of having experienced key financial decisions [91]. People with the highest educational level (third-level education) proved to be the most literate when compared with lower levels [40,83,84]. According to the literature, these results may stem from the greater math and numeracy skills that are associated with education [69]. Among different occupations, microentrepreneurs and private sector employees scored the best FL results. This confirms that individuals working do show better FL scores than those who do not work (housewife/househusband) [73], and the self-employed do better than those in traditional employment [89,90].

Regarding the participants' banking preferences, approximately 70% use online transactions the most frequently, which is encouraging as it would indicate a high level of technological literacy among this group. It would be useful to further study this relationship. Although 1.59% selected none of the above as their preferred method of keeping/investing money, it is important to consider the sample includes high school students, so these results are not too concerning. However, the less than 1% preference for the stock exchange option should be considered by the regulatory framework, perhaps indicating a need for education

to achieve a higher level of literacy regarding capital market development. Seeing as the vast majority (94.27%) of the sample use information provided by the financial institution as their most trusted source, it is reassuring that the financial education they are receiving is coming from this medium.

Despite the relevant research results, this study has a few limitations that the reader should bear in mind. It should be acknowledged that the Likert Scales used for measuring various respondents' answers may be considered subjective. This type of response, particularly the ones regarding FA, may allow participants in this study to answer emotionally and give a favorable answer regarding their attitudes or behaviors towards money.

The current investigation was also limited by the number of participants of the FEP that took part in our post-treatment questionnaire, which means it is only a small sample taken at the investigator's convenience. The sample is 100% from urban areas which have been shown from the extensive research literature to have a higher FL score when compared with rural areas [74,92,95]. Moreover, the conclusions drawn from this study are limited to the financial institution whose information was available and therefore cannot be generalized. The sample would ideally include several FIs, whether public or private, so that the FL results are more robust and can better describe the Ecuadorian population. Additionally, it should be noted that the GP group who decided to approach the institution on their own accord may incur a self-selection bias, which would have affected the results. It is recommended to consider a more numerous and randomized sample in future studies to make proper generalizations about the FL levels of the Ecuadorian population.

This investigation has only examined the validity of a proposed scale tailored to the Ecuadorian context. However, it does not evaluate the effect of the FEP on its participants; before and after treatment data should be retrieved and analyzed to study this effect. Finally, it is important to identify the topics and contents of each financial education program, to assess if the proposed scale is directly applicable to every institution. If it is not, the regulatory perspective should be improved to consider all topics established by the SB.

Nevertheless, the relevance of this study is not overshadowed as it contributes to filling in the gap in the research literature, considering there are no other formal scales to this date that measure the FL levels for the programs being imparted by FIs in Ecuador.

6. Conclusions

Previous studies have shown the relative lack of FL in the country [30,68,69], and even when there are efforts in place to counteract this issue, there are no regulations or evaluations to assess the effects of the FEPs properly. The result is a variety of different approaches by each financial institution. According to regulation, FEPs should encompass the fifteen stated topics, however, not all institutions cover all of them. Similarly, the duration of the programs is not always stated, and target groups, methodologies, and channels differ between institutions. Even when comparing online courses with each other, the type of online learning activities, the materials, resources, and assessments are varied between programs, which is why it is difficult to assess the effectiveness of the programs without a validated scale to do so, and this is the reason we propose one. The differences between programs that complicate their comparability call for a standard evaluation tool to assess if the FEPs are positively impacting their users. Otherwise, measures should be taken to prevent institutions from misusing their financial resources. Moreover, it has been almost a decade since FIs in Ecuador were required to impart FEPs, and to assess if there have been any positive effects on society a scale is necessary to monitor the progress being made regarding this issue. The proposed scale has been validated to serve as a baseline subject to future modifications and tests, given that it is possible that the regulation changes over time.

The authors intend to contribute to the efforts towards the standardization of a scale that can evaluate every FEP imparted by FIs in the country and beyond.

Perhaps the most important implication of the study is the need for further research regarding the effect of the FEP on its participants. Future studies should test if the FEP

interventions are effective, comparing before and after FL results. Furthermore, it should be studied if the program is having a positive long-term impact on its participants and is improving financial well-being.

The validated scale should be used in future studies including rural and urban participants to be a better representation of the Ecuadorian population, as well as participants with different income levels. It is of great importance to know if the FI is reaching rural and lower-income individuals as they probably need it the most [40,92,94].

The regulatory entity should consider a more rigorous revision of the topics dictated by the programs of each institution. Although the regulation states the topics to be included, not every institution includes them all. This is important because the same evaluation tool should be used to make comparisons across different institutions that carry out education programs, which is why it should be encouraged to have the evaluation information publicly available.

Most institutions in the country make a differentiation between programs for different age groups. It is not uncommon to have programs dedicated to children and a younger audience [80,81]. It would be useful to know how these programs are different in the topics taught or the methodologies used. Moreover, more research should be focused on making a proper distinction when interpreting FL scale results from these age groups. A score of 59, which is the average for HS in this study, may not necessarily be a negative result, considering their lack of first-hand experience with interacting with the system, financial products and services, and other topics included in the evaluation.

Similarly, the learning delivery methods used in each FEP should be carefully thought out by the institutions to identify the characteristics that make a program effective. Some may be more effective than others considering the needs and characteristics of the target groups. Online learning, for example, has been proven to have varied outcomes depending on student characteristics such as gender, race, and ability [131]. Therefore, training programs for FL should be developed with specific target groups in mind. Other potential factors include technology access which may be limited to rural areas [93], and technological literacy may be a problem for the elderly [132], which is why more effective alternatives such as traditional in situ courses should be explored in this context [133].

A direct implication for policymakers includes the need for more rigorous control over the FEPs, to make sure they are enhancing participants' financial well-being. Furthermore, the institutions' decision-makers would also benefit from avoiding the waste of financial resources. Lastly, future studies would benefit from an up-to-date diagnosis with more detailed information and characteristics of the FEPs carried out by FIs in the region, to assess areas of improvement and get an overview of the programs.

The present study represents a stepping stone for future investigations to evaluate the effect of the FEPs in Ecuador, and to judge if the efforts of FI are fruitful in delivering positive results.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/su15020996/s1, Table S1: Survey Model; Table S2: Frequency table of FL according to Sociodemographic by Groups. (N:314); Table S3: Frequency table of FL according to Sociodemographic (N:314).

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Institutional Review Board Statement: The study was conducted following the Declaration of Helsinki and approved by the Ethics Committee of ESPOL. Participants were informed about the survey, its implications, and estimated time. Participants could retire from the research with no

consequences. Furthermore, they were informed that their participation was entirely voluntary, and data is confidential and only for research purposes.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. The FL Scale and Item Characteristics: Factor Loading. (n:314).

Code	Items	Factor Loading	Item Source	
			Author	*Action*
	FK (correct answer). α 0.794			
FK-1	What type of income do you think should be used for budgeting? [Money owed to us by other people]; [Inheritance to receive in the future]; [Fixed income]; [Variable income]; [None of the above]; [I don't know]	X	2	A
FK-2	What is the regulation in charge of protecting the rights of the Financial User? [Comprehensive Organic Criminal Code]; [Internal Tax Regime Law]; [Companies Law]; [User Rights Code]; [None of the above]; [I don't know]	0.83	1	N
FK-3	Regulatory entity of the State that is in charge of regulating and controlling the financial activity of cooperatives at the national level. [Superintendency of Banks of Ecuador]; [Superintendence of Popular and Solidarity Economy]; [Superintendency of Companies]; [Superintendency of market power control]; [None of the above]; [I don´t know]	0.85	1	N
FK-4	Is the Pledge Credit a . . . ? [Education Credit]; [Credit to buy clothes]; [Credit to acquire a movable property]; [Credit to pay debts]; [None of the above]; [I don´t know]	0.90	1	N
FK-5	Regulatory entity of the State that controls and monitors the financial activity in the country of banks, mutuals, and financial companies. [Superintendency of Companies]; [Superintendency of Banks of Ecuador]; [Superintendence of Popular and Solidarity Economy]; [Superintendency of market power control]; [None of the above]; [I don´t know]	0.69	1	N
FK-6	What are the financial services distribution channels? [Virtual Banking/Mobile/Telephone/Transactional]; [ATMS]; [Agencies and Counters]; [Call center]; [All of the above]; [I don´t know]	0.95	1	N
FK-7	What is defined as a demand deposit contract between the bank and the client, which allows one to earn interest? [Current account]; [Savings account]; [Policy]; [Insurance]; [None of the above]; [I don´t know]	0.84	1	N
FK-8	In what kinds of situations can insurance cover us? [Loss of household assets due to theft]; [Unplanned expenses on health issues]; [Loss of income for our family, in the event of death]; [All of the above]; [None of the above]; [I don´t know]	0.58	2	A
FK-9	Remittances are . . . .? [Money transfers made by private companies in the same country]; [Money transfers made by people in the same country]; [Money transfers made by people from one country to another]; [Money transfers made by public companies in the same country]; [None of the above]; [I don´t know]	X	4	A
FK-10	Who is the customer advocate? [It is a support for clients in the face of any problem related to financial products and/or services]; [It is a mediator between the user and the Financial Institution]; [It is a protector of the particular rights and interests of the clients of a financial institution]; [All of the above]; [None of the above]; [I don´t know]	0.43	1	N
	FB (1 Never–5 Always). α 0.956			
FB-1	When you apply to a credit do you know what INSURANCE you are paying?	0.94	5	A
FB-2	Do you create a monthly budget for personal expenses.	0.95	3	A
FB-3	Do you choose products in an informed way.	0.96	3	A
FB-4	Do you prefer to buy assets with your own savings rather than to go into debt.	0.89	2	A
FB-5	Do you frequently save at least a minimum percentage of your income.	0.94	7	A
	FA (1 Strongly disagree- 5 Completely agree). α 0.630			
FA-1	Do you consider that you have extensive knowledge of the products offered by FI?	0.81	3	A
FA-2	Do you consider that saving is a positive exercise for your financial growth?	0.64	3	A

Table A1. *Cont.*

Code	Items	Factor Loading	Item Source	
			Author	*Action*
FA-3	Do you consider that keeping a record of income, expenses, and debts is important?	0.72	2	A
FA-4	Do you rely on transactional channels to enter passwords and inquire about financial products/services?	0.77	4	A
FA-5	Are you are willing to risk some of your own money when making an investment?	0.79	6	C

α Cronbach´s alpha (Cronbach 1951)
X: Deleted Items after Correlational analysis.
This scale based on seven formal studies.

1. The authors, 7 or 35%
2. (G20/OECD INFE Core Competencies Framework on FL for Adults 2016), 4 or 20%
3. (OECD/INFE Core Competencies Framework on FL for Youth 2015), 4 or 20%
4. (CAF Cuestionario de medición de capacidades financieras de Argentina 2017), 2 or 10%
5. (OECD/INFE International Survey of Adult FL Competencies 2016), 1 or 5%
6. (CAF Cuestionario de medición de capacidades financieras de Ecuador 2013), 1 or 5%
7. (Potrich, Vieira, and Kirch 2018), 1 or 5%

Twenty Items: 60% Adapted (A), 5% Copy (C), and 35% New (N).

Table A2. Correlations Matrix between FL and Its Dimensions and Sociodemographic Factors.

	FL	FK	FB	FA	Gender	Age	Marital Status	Educational Level	Occupation
FL	1.00								
FK	0.86 ***	1.00							
FB	0.88 ***	0.54 ***	1.00						
FA	0.86 ***	0.58 ***	0.81 ***	1.00					
Gender	−0.04	−0.11	0.04	0.00	1.00				
Age	0.72	0.54	0.76	0.62	0.08	1.00			
Marital status	0.64	0.43	0.66	0.63	0.10	0.88	1.00		
Educational level	0.72	0.54	0.76	0.58	0.06	0.77	0.43	1.00	
Occupation	−0.49	−0.41	−0.52	−0.33	−0.09	−0.61	−0.19	−0.80	1.00

*** $p < 0.001$(Pearson). Notes: Pearson FL, FK, FB, FA; Polyserial FL, FK, FB, FA and sociodemographic factors; Polychoric sociodemographic factors.

Table A3. One-way ANOVA to FL and its dimensions by groups.

Source		Type II Sum of Squares	df	F-Statistic	*p*-Value	η_p^2	Post Hoc Comparisons-Bonferroni
FL	Groups	5.99	3	188.12	0.000 ***	0.64	HS < CE HS < GP HS < FIE CE = GP CE < FIE GP < FIE
	Residuals	3.29	310				
FK	Groups	9.45	3	81.76	0.000 ***	0.44	HS < CE HS < GP HS < FIE CE = GP CE < FIE GP = FIE
	Residuals	11.94	310				
FB	Groups	9.83	3	163.57	0.000 ***	0.61	HS < CE HS < GP HS < FIE CE = GP CE < FIE GP < FIE
	Residuals	6.21	310				

Table A3. *Cont.*

Source		Type II Sum of Squares	df	F-Statistic	*p*-Value	η_p^2	Post Hoc Comparisons-Bonferroni
FA	Groups	1.52	3	68.37	0.000 ***	0.40	HS < CE HS < GP HS < FIE CE = GP CE < FIE GP < FIE
	Residuals	2.29	310				

*** $p < 0.001$

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