
VALIDITY AND RELIABILITY ANALYSIS OF A FINANCIAL LITERACY SCALE IN UNIVERSITY STUDENTS IN PERU

Mervin Juan Chávez-Ruiz, Elizabeth Emperatriz García-Salirrosas, Ghenkis A. Ezcurra-Zavaleta and Jesús Fernando Bejarano-Auqui

SUMMARY

The relevance and urgency of financial education have been notable in recent years as it seeks to contribute to the common good of society, particularly for the younger population. This study presents a validated financial literacy (FL) scale for Peruvian university students with a favorable degree of reliability. The FL scale analyzed includes two dimensions: financial behavior and attitude. To carry out this study, 400 university students from 15 different public and private universities from the coast, mountains, and jungle of Peru were surveyed. Con-

firmatory factor analysis provided adequate support for the two-factor model with 11 items (CMIN/DF =2.602; CFI =0.974; RMSEA =0.063; SRMR =0.045; and PClose =0.061), in addition to showing good internal consistency based on the values of Alpha (0.915, 0.873) and CR (0.916, 0.875). The results suggest that the scale presents adequate psychometric evidence to measure financial literacy in university students. Thus, it aims to contribute to the advancement of the scientific study of financial education in Peru.

Introduction

Financial literacy (FL) consists of learning the basic concepts and rules of finance (Cevallos Vique *et al.*, 2020). It also involves the knowledge and skills that allow a person to make the right financial decisions (Lusardi and Mitchell, 2023; Morvai *et al.*, 2022). In this sense, FL is a crucial

aspect in the academic and personal training of university students (Marinov, 2020), since it provides them with the necessary skills to make informed financial decisions and efficiently manage their economic resources (Kaur, 2023). In most countries, the low FL of young people is striking (Garg and Singh, 2018). This causes a social problem in Latin

American countries (López *et al.*, 2019).

In the Peruvian context, where access to financial education is fundamental for economic and social development, it is imperative to evaluate the effectiveness of existing tools (Frisancho *et al.*, 2023). Therefore, public, and private companies are encouraged to implement FL at school projects

and (Amonhaemanon, 2023) strategies. To create business opportunities and financial knowledge, financial education programs aimed at young people must be promoted (Jonker and Kosse, 2022; Salas-Velasco, 2022; Vijaykumar, 2022). Morgan and Long (Morgan and Long, 2020) confirm the positive effects of FL.

KEYWORDS / Confirmatory Factor Analysis and Structural Model / Financial Attitude / Financial Behavior / Financial Literacy /

Received: 05/09/2024. Modified: 02/24/2025. Accepted: 03/01/2025.

Mervin Juan Chávez-Ruiz (Autor de correspondencia). Magíster en Administración de Negocios, candidato a Doctor en la Universidad Peruana Unión, Lima, Perú. Dirección: Universidad Peruana Unión, Lima Perú. e-mail: mervin.chavez@upeu.edu.pe. ORCID: 0000-0003-0709-9747

Elizabeth Emperatriz García-Salirrosas. Doctora en Administración de Negocios, Universidad Autónoma del Perú Profesora, Universidad Autónoma del Perú. e-mail: egarciasa@autonoma.edu.pe. ORCID: 0000-0003-4197-8438.

Ghenkis A. Ezcurra-Zavaleta. Doctora en Administración de

Negocios, Universidad Nacional de Tumbes, Perú. Profesor, Universidad Nacional de Tumbes, Tumbes, Perú. e-mail: gezcurraz@untumbes.edu.pe. ORCID: 0000-0002-9894-2180.

Jesús Fernando Bejarano-Auqui. Doctor en Administración de Negocios, Universidad Peruana Unión Lima, Perú. Profesor,

Universidad Peruana Unión, Lima, Perú. e-mail: jesusbearano@upeu.edu.pe. ORCID: 0000-0003-4197-8438.

ANÁLISIS DE VALIDEZ Y CONFIABILIDAD DE UNA ESCALA DE ALFABETIZACIÓN FINANCIERA EN ESTUDIANTES UNIVERSITARIOS DEL PERÚ

Mervin Juan Chávez-Ruiz, Elizabeth Emperatriz García-Salirrosas, Ghenkis A. Ezcurra-Zavaleta y Jesús Fernando Bejarano-Auqui

RESUMEN

La relevancia y urgencia de la educación financiera ha sido notable en los últimos años, ya que busca contribuir al bien común de la sociedad, particularmente para la población más joven. Este estudio presenta una escala de alfabetización financiera (AF) validada para estudiantes universitarios peruanos con un grado favorable de fiabilidad. La escala de AF analizada incluye dos dimensiones: comportamiento financiero y actitud. Para llevar a cabo este estudio, se encuestaron a 400 estudiantes universitarios de 15 universidades públicas y privadas de la costa, sierra

y selva del Perú. El análisis factorial confirmatorio proporcionó un apoyo adecuado para el modelo de dos factores con 11 ítems (CMIN/DF =2,602; CFI =0,974; RMSEA =0,063; SRMR =0,045; y PClose =0,061), además de mostrar una buena consistencia interna basada en los valores de Alpha (0,915; 0,873) y CR (0,916 ; 0,875). Los resultados sugieren que la escala presenta evidencia psicométrica adecuada para medir la alfabetización financiera en estudiantes universitarios. Así, se busca contribuir al avance del estudio científico de la educación financiera en el Perú.

ANÁLISE DE VALIDADE E CONFIABILIDADE DE UMA ESCALA DE ALFABETIZAÇÃO FINANCEIRA EM ESTUDANTES UNIVERSITÁRIOS DO PERU

Mervin Juan Chávez-Ruiz, Elizabeth Emperatriz García-Salirrosas, Ghenkis A. Ezcurra-Zavaleta e Jesús Fernando Bejarano-Auqui

RESUMO

A relevância e urgência da educação financeira têm sido notáveis nos últimos anos, pois buscam contribuir para o bem comum da sociedade, especialmente para a população jovem. Este estudo apresenta uma escala de alfabetização financeira (AF) validada para estudantes universitários peruanos com um grau favorável de confiabilidade. A escala de AF analisada incluiu duas dimensões: comportamento financeiro e atitude. Para realizar este estudo, foram entrevistados 400 estudantes universitários de 15 universidades públicas e privadas da costa, serra

e selva do Peru. A análise fatorial confirmatória forneceu um suporte adequado para o modelo bifatorial de 11 itens (CMIN/DF =2,602; CFI =0,974; RMSEA =0,063; SRMR =0,045; e PClose =0,061), além de mostrar boa consistência interna com base nos valores de Alpha (0,915; 0,873) e CR (0,916 ;0,875). Os resultados sugerem que a escala apresenta evidências psicométricas adequadas para medir a alfabetização financeira em estudantes universitários. Assim, busca-se contribuir para o avanço do estudo científico da educação financeira no Peru.

Conducting research on financial literacy (FL) for university students is an important contribution to society and enhances their financial well-being (Dahiya *et al.*, 2023). It is crucial to highlight that university students finance their studies, and low FL tends to lead them into debt with their student finances (Artavanis and Karra, 2020; Markle, 2019). Therefore, measuring the level of FL throughout their career path is essential (Rangchian *et al.*, 2020). In a study carried out by Horobet *et al.* (2020), which measured the level of FL in Romanian university students, significant differences were found among them. These determinants of FL levels among university students were explored by Cull and Whitton (2011), who identified the methods students preferred to

learn about finances. Happ *et al.* (2022), on the other hand, show that it is possible to measure FL accurately with specific adaptations for university students in each country. This article places financial education in the context of university students as a research focus and proposes a FL measure to raise awareness about financial risks and highlight their importance (Le Fur and Outreville, 2022; Pietrantonio and Garriott, 2017).

In this context, the present study focuses on the analysis of the validity and reliability of a scale designed to measure financial literacy in university students in Peru. Through a rigorous evaluation process, we aim to provide a deeper understanding of the usefulness and accuracy of this tool, thus contributing to the advancement of

knowledge in the field of financial education and offering valuable insights to improve educational strategies in this area. In addition, it has important theoretical, practical, and business implications. From a theoretical perspective, this study contributes to the field of financial education by providing a validated instrument to measure the level of financial literacy in a specific population, informing future educational research and policies. On the practical side, by using validated and reliable measures, educational institutions can accurately and objectively assess their students' financial literacy, identify areas for improvement, and create more effective educational programs. For companies, understanding the level of financial education of students is essential for

making recruitment decisions, designing training programs, and developing financial communication strategies for students, thus improving the financial literacy of individuals and organizations in the Peruvian context. Furthermore, understanding finance can help develop specific programs that reduce financial ignorance, leading to better economic decision-making and financial planning. Additionally, companies can design financial communication strategies tailored to students and potential partners by fostering an organizational culture based on financial education. This not only helps students but also enables them to manage their income and savings more effectively. The involvement of companies in financial education in the Peruvian context, where levels remain low, not

only promotes the personal development of students but also positively impacts their economy and budget.

Literature reviews

A study related to financial management was conducted in New Zealand. It has a population of (299) female undergraduate and graduate students at a university in Minnesota and another in California who had resided in the United States. The dimensions addressed in the research include: cash flow and debt management, credit repair and construction, development of financial goals, savings and investment, and taxation and financial protection. A scale was tested and created to assess women's financial education, achieving a reliability coefficient of 0.93 and consistency in the factorial study of the construct categories (Nguyen, 2019). In South Africa, another study related to entrepreneurship validated an instrument with 34 items divided into 7 dimensions within which is financial literacy, the population was entrepreneurs and employees (Ephrem and Murimbika, 2023). While Vieira *et al.*, (2021) in their research carried out in 2016 aimed at citizens in Brazil, it presented a construct that referred to three AF dimensions: Financial knowledge, financial behavior and financial attitude, their study only examines the last two dimensions, which were assessed for their potential through exploratory and confirmatory factor analysis. The concern of the private sector in achieving the validation of a reliable and validated instrument for FL is also noted. In this case, in Ecuador, educational and financial institutions provided financial education programs to approximately 1,800 people and with a representative sample of 314 people, they managed to validate an 18-item instrument, with a degree of reliability in its three dimensions, financial knowledge (0.794), behavior financial (0.956) and financial attitude of (0.638) (Méndez-Prado *et al.*,

2023). A validation and reliability investigation were found for high school students for the Chilean context, the construct is made up of 8 items and the Liker scale was used with an ordinal alpha of 0.923 (Denegri Coria *et al.*, 2019). Considering the access and use of digital financial services, an instrument called digital financial education was validated in 2021 in Bangalore, India with a reliability degree of 0.923 and in the same country a construct was also validated for professors at a business school with 7 dimensions with a composite reliability above 0.8 in all items, this study was carried out with more than 300 participants (Lone and Bhat, 2022; Ravikumar *et al.*, 2022).

Regarding studies related to university students, a study was found in which 204 university students from Malaysia and Indonesia participated to measure financial literacy in two dimensions' financial behavior and financial attitude. The results indicated that financial literacy significantly influences students' financial behavior and attitude, highlighting differences between the two. Both dimensions reached a Cronbach's alpha of 0.682 and 0.807 respectively, in the PA measurement, the Malay students reached 69.49 points and the Indonesian students 80.17 and in the T tests the differences are significant ($P < 0.01$) (Khalisharani *et al.*, 2022). Another validated construct measured PA from the personal finance scale through a population of 93 university students, which was carried out by North American researchers, just as they took this scale in other countries, the PISA-18 (It looks at whether students can apply lessons learned in school to their daily routine. It assesses life skills such as science, math, reading, and financial literacy) test was taken to measure the PA scale (Kolachev *et al.*, 2021; Yang and Lester, 2016). Additionally, we later found a construct that dimensioned PA that was developed by Peruvians but for the context of the country of

India where it covers a youth population and had representative participation of university students (Murugesan *et al.*, 2022). For the context of Latin America and the Caribbean, a FL construct was validated for young adults with 478 participants with 44 items, three dimensions: financial behavior, financial attitude and financial knowledge, which had good reliability with a consolidated Cronbach's alpha of 0.855 (Prado *et al.*, 2022). In the Peruvian case, Frisancho (Frisancho, 2023) conducted a study on the evaluation of financial literacy programs in 300 schools in Peru and since these had positive effects on the financial behavior of students, the study was carried out in 6 representative regions of the country and was focused to regular basic education students.

As can be seen, various studies can be found that provide validation of FL instruments in different countries; however, due to cultural and educational differences, it is necessary to have a validated and reliable scale in its interpretation for the Peruvian context. However, the lack of validation studies of instruments to evaluate the financial literacy of university students and thus guarantee more precise results that help decision-making is evident. Therefore, the objective of this study is to analyze the validity and reliability of a scale to evaluate FL in university students in Peru. The contribution lies in filling a research gap, identifying areas for improvement, promoting FL and generating data for decision making.

Method

Population and sample

This study evaluated 400 university students from Peru, selected from 15 universities located in the coast, mountains, and jungle regions. This distribution ensures a diverse representation of Peruvian geographical contexts, which is

essential for understanding the varied educational experiences across the country. Additional details are provided in Table I. In terms of gender distribution, 59% of the respondents were women (236), and 41% were men (164). The sample included students from year I to academic year V, with the majority in year I (33.8%) and a decreasing distribution in the higher years. Most respondents (92.8%) belong to private universities, which reflects the greater participation of these institutions in the sample. In terms of geographical location, most students live and study in the following regions: 77% in coastal areas, 12.8% in jungle areas, and 10.3% in mountain areas. The age range of the participants was quite wide, with 68.5% between 15 and 22 years old, 24% between 23 and 30 years old, and 7.5% aged between 31 and 70 years old.

Regarding areas of study, health sciences represented most of the sample, with 63.25%, followed by social sciences with 15.75%, and both engineering and economics each represented 10.50%.

Data collection procedure

In this study, fifteen universities were contacted for permission and collaboration to distribute surveys to students. The surveys, hosted on Google Forms, were disseminated through social networks and emails. This dual strategy allowed for broad student participation, ensuring efficiency and representativeness in data collection while respecting its integrity and confidentiality.

Measuring instrument

The instrument used in this study was based on the questionnaire developed and validated by Mena-Campoverde (2022). The original questionnaire, known as Financial Literacy in Young People, was applied in Ecuador and consists of three dimensions: knowledge, attitudes, and financial behavior. For the present study, only two dimensions

TABLE I
SOCIODEMOGRAPHIC DATA (N =400)

Characteristic	Category	Frequency	Percentage (%)
Sex	Man	164	41.0
	Women	236	59.0
Academic year	I year	135	33.8
	II year	94	23.5
	III year	55	13.8
	IV year	37	9.3
	V year	79	19.8
University type	Private	371	92.8
	Public	29	7.3
Place where you live and study	Coast	308	77.0
	Mountain range	41	10.3
	Jungle	51	12.8
Age range	Between 15 to 22 years	274	68.5
	Between 23 to 30 years	96	24.0
	31 to 70 years	30	7.5
Professional study areas	Health	253	63.25
	Engineering	42	10.50
	Economic	42	10.50
	Social	63	15.75

from the Mena-Campoverde (2022) instrument were used, which were financial behavior and financial attitude. Considering the dimensions under analysis, the financial behavior dimension includes a total of 6 questions that assess participants' financial practices and decisions, while the financial attitude dimension includes 5 questions that explore attitudes and beliefs related to individual finances. Each question is rated on a 5-point Likert scale ranging from "totally disagree" to "totally agree."

Statistical method

The study began with a descriptive analysis of a sample of 400 participants, evaluating basic statistics and the normality of the distribution for each item, focusing on the mean, standard deviation, skewness, and kurtosis, following the normality criteria of Ferrando and Anguiano-Carrasco (2010). As suggested by Cabrera-Nguyen (2010), to validate the questionnaires, an exploratory factor analysis (EFA) was first

performed in SPSS. The adequacy of the data for factor analysis was verified using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity, with expectations of a KMO >0.7 and a Bartlett p-value < 0.05. Subsequently, a confirmatory factor analysis (CFA) was conducted using AMOS, aiming for significant factor loadings and an average

variance extracted (AVE) > 0.5, in addition to reliability measures with Cronbach's alpha and composite reliability > 0.7, following the guidelines of Agbo (2010); Bagozzi and Yi (1988); Fornell and Larcker (1981).

To evaluate discriminant validity, criteria from Fornell and Larcker (1981) and the Heterotrait-Monotrait Ratio

(HTMT) from Henseler *et al.* (2015) were applied, with expectations of appropriately lower inter-construct correlations and HTMT values < 0.90. Finally, the model fit indices were evaluated to ensure they met the standards recommended by Hu and Bentler (1999) and Schermelleh-Engel *et al.* (2003), including CFI > 0.9, RMSEA < 0.08, SRMR < 0.08, p close > 0.05, and CMIN/DF < 3, indicating good model fit.

Results

Table II presents the descriptive statistical results of the items, such as the mean, standard deviation, skewness, and kurtosis of the scale. It is observed that the skewness and kurtosis values are mostly less than ± 1.5 (Ferrando and Anguiano-Carrasco, 2010). The maximum likelihood method was employed because it has the advantage of producing estimates that are asymptotically efficient and consistent, and with large samples, the estimate is robust to slight violations of the multivariate method assumption of non-normality (Hox *et al.*, 2017).

Exploratory factor analysis

III shows the exploratory factor analysis (EFA) of the items, where the items are

TABLE II
DESCRIPTIVE ANALYSIS OF THE ITEMS (N =400)

Code	Half	Deviation	Asymmetry	Kurtosis
FA1	4.1275	1.09281	-1,147	0.501
FA2	4.2375	1.01670	-1,237	0.788
FA3	4.1050	1.07558	-1,145	0.652
FA4	4.1450	1.02058	-1,090	0.556
FA5	4.0050	1.15686	-1,015	0.123
FB1	3.9400	1.12453	-0.891	0.074
FB2	3.5000	1.28223	-0.452	-0.900
FB3	3.6750	1.14352	-0.552	-0.495
FB4	3.5525	1.17503	-0.490	-0.540
FB5	3.5800	1.21956	-0.529	-0.571
FB6	3.9775	1.14904	-0.882	-0.171

FA: Financial attitude; FB: Financial behavior.

TABLE III
EXPLORATORY FACTOR ANALYSIS (EFA)
PATTERN MATRIX

Items	Factor	
	1	2
FA3	0.870	
FA2	0.847	
FA1	0.839	
FA4	0.829	
FA5	0.695	
FB4		0.869
FB2		0.800
FB3		0.792
FB5		0.699
FB6		0.530
FB1		0.490

FA: Financial attitude; FB: Financial behavior; Extraction method: maximum likelihood. Rotation method: romax with Kaiser normalization. Source: Own elaboration.

distributed into two factors according to the variable analyzed. It is observed that there is a clear distinction between the two factors. The KMO and Bartlett test (Kaiser-Meyer-Olkin measure of sampling adequacy = 0.925), greater than 0.7, is high, and the Bartlett test (Sig = 0.000) is very significant for conducting factor analysis. The total variance explained in the model is 61.103%, which is greater than 50%, with financial attitude (FA) = 50.677% and financial behavior (FB) = 10.426%. All items were grouped according to their initial dimensions. Then, we proceeded with confirmatory factor analysis (CFA).

Table IV shows the validation of the final measurement model with convergent reliability and validity. It is observed that the values of Cronbach's Alpha (α) are 0.873 and 0.915. These values are satisfactory since, for the model to be considered at an adequate level, all values must be above 0.70 (Agbo, 2010). Likewise, the composite reliability (CR) values are 0.875 and 0.916, which is also favorable since, for it to be considered an optimal model, the values must be greater than 0.60 (Bagozzi and Yi, 1988). On the other hand, the AVE

values are 0.540 and 0.687, which are considered optimal since, to have acceptable values for this indicator, they must be equal to or greater than 0.5 (Hair *et al.*, 2014). This means that the measurement model meets all the indicators of reliability and convergent validity.

Table V shows the fit indicators of the quality measurement model of the financial literacy scale. According to the results of the CFA with a two-dimensional structure, the eleven items explained the two factors, all obtaining excellent fit indices, except for the mean square error of approximation, whose value is acceptable.

The Fornell-Larcker criterion was used; thus, the square root of the AVE of each factor was calculated, which had to be greater than the highest correlation between both factors of the measurement model (Hair *et al.*, 2014). Table VI shows that all values on the bold diagonal are greater than the correlations. Additionally, in this study, the heterotrait-monotrait (HTMT) (Henseler *et al.*, 2015) criterion has been considered. If the HTMT value is less than 0.90, it is considered that there is discriminant validity between two reflective constructs. In this sense, Table V shows that the correlation value is 0.684,

TABLE IV
VALIDATION OF THE FINAL MEASUREMENT MODEL WITH CONVERGENT
RELIABILITY AND VALIDITY

Code	Items	Estimate	Asymmetry	Kurtosis	
Financial attitude	FA1	0.823 ***			
	FA2	0.841 ***			
	FA3	0.847 ***	0.915	0.916	0.687
	FA4	0.856 ***			
	FA5	0.775 ***			
Financial behavior	FB1	0.629 ***			
	FB2	0.747 ***			
	FB3	0.813 ***			
	FB4	0.806 ***	0.873	0.875	0.540
	FB5	0.727 ***			
	FB6	0.668 ***			

FA: Financial attitude; FB: Financial behavior; α : Cronbach's alpha >0.8; Composite reliability: CR > 0.70, AVE: Mean-variance extracted > 0.50; *** p < 0.001 (significance level), indicating a significant validity of the model.

TABLE V
STATISTICAL GOODNESS-OF-FIT INDICES OF THE FINANCIAL LITERACY SCALE

Extent	Limit	Estimate	Interpretation
CMIN	-	111,884	--
DF	-	43	--
CMIN/DF	Between 1 and 3	2,602	Excellent
CFI	>0.95	0.974	Excellent
SRMR	<0.08	0.045	Excellent
RMSEA	<0.06	0.063	Acceptable
PClose	>0.05	0.061	Excellent

CFI: Comparative Fit Index; CMIN/DF: minimum discrepancy of confirmatory factor analysis/degrees of freedom; Pclose: p-value for rejecting the null hypothesis that the model fits the individual subject's data; RMSEA: Root Mean Square Error of Approximation; SRMR: Standardized Root Mean Residual.

which is less than 0.90. With these results, the discriminant validity of the model is met (Figure 1).

Discussion

The results of this research indicate that financial literacy is not reduced solely to the understanding of economic concepts, nor is it confused with the teaching of those concepts. Instead, it is a multidimensional construct that can be understood and assessed through the analysis of financial behavior, financial

attitudes, dispositions toward money, and the understanding of aspects related to savings, investment, long-term planning, budget and debt management, in addition to the appropriate management of money over time and inflation. Based on the results obtained, it is necessary to strengthen and improve educational programs related to financial attitude (> 0.80) in university institutions that allow students to make better decisions in their investments. According to the OECD (C. Mena-Campoverde, 2022), in

Latin America, 70% of students are savers and control their expenses. This highlights the importance of the validity and reliability of literacy scales that ensure the effective development of students' basic financial skills. The research highlights the need for specific measurement tools to assess financial behavior (< 0.80). Developing validity tools aligned with the reality of financial literacy of university students in Peru (Muguerza *et al.*, 2023). Properly validated instruments can be used to measure the financial quality of Peruvian students. The literature review allowed us to identify the levels of financial education in higher education students belonging to different careers, economic levels, and ages from different universities. In this way, (González, 2020) states that the examining group made up of students from the Faculty of Humanities and Communication Sciences lack theoretical foundations in financial education. Along the same lines, (Bozzo and Remeseiro, 2021) pointed out that, in their sample of Law students, financial knowledge is not sufficient, which generates disadvantages compared to students from other faculties that have a curriculum with more financial subjects. Thus, it is shown that those who do not study in fields related to administration exhibit a low level of financial education. Coinciding with the results of (Wong and Burneo, 2019), who indicated that business students have better knowledge of personal finance, it should be noted that the topics addressed in classes do not correspond to

reality. In research carried out by (Pérez *et al.*, 2018), using a sample of students from the Faculty of Economic and Administrative Sciences, it was observed that only 7% of students prepare a financial plan. Furthermore, it was found that the financial decisions of 76% of students are affected by a family member with experience in the financial field. However, (Moreno-García *et al.*, (2017)) studied a group of 115 students between 21-25 years old in careers related to finance and found that they have knowledge and habits about budgeting, although their financial education is not sufficient. This is evidenced in their use of credit cards, while they show little interest in saving. In this sense, (Zapata *et al.*, 2016) indicate that the absence of a savings culture can harm not only the social and economic well-being of the individual, but also the financial growth of the country. This can affect the financial and social well-being of the individual and even the economic development of the country. Thus, adequate financial management makes it easier for people and families to better manage money, providing greater opportunities to undertake if savings and investment practices are incorporated (López-Lapo *et al.*, 2021). It is essential to have financial knowledge that facilitates adaptation to the changes generated by globalization, since purchasing power directly influences financial decisions, especially financial education and the savings capacity of Generation Z.

Implications

The evaluation reveals differences in the level of financial literacy among Peruvian university students. This highlights the need to develop personalized educational strategies that consider individual differences in financial understanding and take into account the validity and reliability of the literacy scale in Peruvian universities. The results of the

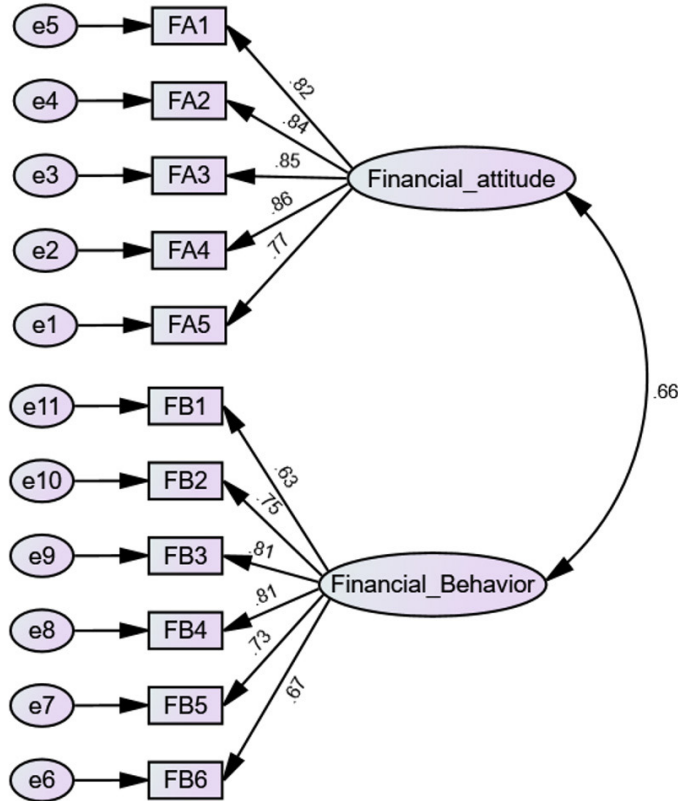


Figure 1. Factor structure of the financial literacy scale.

TABLE VI
DISCRIMINANT VALIDITY

Fornell-Larcker criterion			Heterotrait-monotrait ratio (HTMT)	
	FA	FB	Correlation	HTMT
FA	0.829			
FB	0.663	0.854	FA-FB	0.684

FA: Financial attitude; FB: Financial behavior.

evaluation provide basic information for the formulation of educational policies at the national level. Educational and government authorities can use this information to adapt or create policies that promote financial literacy in the university environment. This highlights the crucial need to adapt the higher educational environment to the financial demands of society and the economy.

Limitations

Limitations may be due to the influence of cultural and contextual factors specific to Peru on the interpretation of the scales. The validity of the measurement may be compromised if the scale does not sufficiently take into account the cultural and economic characteristics of the country, which affects the generalizability of the results. The diversity of financial experiences of college students can be a limitation. If the scale does not adequately describe this heterogeneity, the validity of the measurements may be questioned. For example, students from different backgrounds may interpret questions differently, which affects the consistency of the scale.

The scale may have limitations in its ability to capture changes in financial literacy over time. Fluctuations in financial literacy at the national level or changes in educational policy may not be sufficiently reflected in the scale, jeopardizing the temporal reliability of the measurements.

Future research

Future research could compare the Peruvian financial literacy scale with international standards to evaluate its global applicability, identifying areas for improvement and contextualizing the financial literacy of Peruvian students in a broader framework. Cross-validation research with recognized instruments could strengthen the evidence of the validity and reliability of the financial

literacy scale in Peruvian students, offering a more complete view of their financial skills. Longitudinal research could be valuable to understand how financial literacy evolves among Peruvian university students over time.

Conclusions

The exhaustive analysis of the validity and reliability of the financial literacy scale in Peruvian university students demonstrates not only the methodological soundness of this instrument, but also its relevance and effectiveness within the Peruvian educational system. It provides a detailed representation of college students' financial literacy, offering insight into their capabilities and knowledge in this critical area. These findings show that the scale is a reliable assessment tool and can be used to inform educational policies and strategies aimed at increasing financial literacy in Peruvian universities. Recognition of the importance of these results allows the implementation of personalized interventions that address identified areas of improvement, ultimately contributing to the strengthening of financial education and economic empowerment among Peruvians, and ultimately, promoting greater financial stability and economic well-being in society.

REFERENCES

- Agbo AA (2010) Cronbach's Alpha: Review of Limitations and Associated Recommendations. *Journal of Psychology in Africa* 20: 233–239. <https://doi.org/10.1080/14330237.2010.10820371>.
- Amonhaemanon D (2023) Financial stress and gambling motivation: the importance of financial literacy. *Review of Behavioral Finance* (ahead-of-print). <https://doi.org/10.1108/RBF-01-2023-0026>.
- Artavanis N, Karra S (2020) Financial literacy and student debt. *The European Journal of Finance* 26: 382–401. <https://doi.org/10.1080/1351847X.2019.1711435>.
- Bagozzi RP, Yi Y (1988) On the evaluation of structural equation models. *Journal of the Academy of Marketing Science* 16: 74–94. <https://doi.org/10.1007/BF02723327>.
- Bozzo S, Remeseiro R (2021) Hacia un currículo que fortalezca la educación financiera en las carreras de derecho. *Revista Pedagogía Universitaria y Didáctica del Derecho* 8: 45–67. <https://doi.org/10.5354/0719-5885.2021.61454>.
- Cevallos Vique VO, Valverde Aguirre PE, Orna Hidalgo LA, Cargua Pilco E (2020) La educación financiera y su incidencia en la capacidad de gestión de los comerciantes de la empresa pública municipal Mercado de Productores Agrícolas San Pedro de Riobamba (EP-EMMPA) *Visionario Digital* 4: 5–21. <https://doi.org/10.33262/visionariodigital.v4i2.1201>.
- Cull M, Whitton D (2011) University Students' Financial Literacy Levels: Obstacles and Aids. *The Economic and Labour Relations Review* 22: 99–114. <https://doi.org/10.1177/103530461102200106>.
- Dahiya M, Özen E, Yadav K (2023) The Financial Literacy of College Students: Evidence from India. *ASR: Chiang Mai University Journal of Social Sciences and Humanities* 10. <https://doi.org/10.12982/CMUJASR.2023.009>.
- Denegri Coria M, Concha-Salgado A, Aravena JS (2019) Adaptation and Validation of the Economic and Financial Literacy Test for Chilean secondary students. *Revista Latinoamericana de Psicología* 51: 113–122. <https://doi.org/10.14349/rlp.2019.v51.n2.6>.
- Ephrem AN, Murimbika M (2023) Development and validation of an individual entrepreneurial potential new measurement scale. *Journal of Research in Marketing and Entrepreneurship*, 26: 63–110. <https://doi.org/10.1108/JRME-07-2022-0094>.
- Ferrando PJ, Anguiano-Carrasco C (2010) El Análisis Factorial Como Técnica de Investigación en Psicología. *Papeles del Psicólogo* 31: 18–33. <http://www.cop.es/papeles>.
- Frisancho V (2023) Is School-Based Financial Education Effective? Immediate and Long-Lasting Impacts on High School Students. *The Economic Journal* 133: 1147–1180. <https://doi.org/10.1093/ej/ueac084>.
- Frisancho V, Herrera A, Prina S (2023) Can a mobile-app-based behavioral intervention teach financial skills to youth? Experimental evidence from a financial diaries study *. *Journal of Economic Behavior and Organization* 214: 595–614. <https://doi.org/10.1016/j.jebo.2023.08.014>.
- Garg N, Singh S (2018) Financial literacy among youth. *International Journal of Social Economics* 45: 173–186. <https://doi.org/10.1108/IJSE-11-2016-0303>.
- González A (2020) Educación financiera de jóvenes universitarios de la Facultad de Humanidades y Ciencias de la Educación, periodo 2019-2020. *Ciencia Latina Revista Científica Multidisciplinar* 4: 1408–1426. https://doi.org/10.37811/cl_rcm.v4i2.163.
- Hair J, Sarstedt M, Hopkins L, Kuppelwieser V (2014) Partial Least Squares Structural Equation Modeling (PLS-SEM): An Emerging Tool for Business Research. *European Business Review* 26: 106–121. <https://doi.org/10.1108/EBR-10-2013-0128>.
- Happ R, Hahn J, Jang K, Rüter I (2022) Financial knowledge of university students in Korea and Germany. *Research in Comparative and International Education* 17: 301–327. <https://doi.org/10.1177/17454999221086357>.
- Henseler J, Ringle CM, Sarstedt M (2015) A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science* 43: 115–135. <https://doi.org/10.1007/s11747-014-0403-8>.
- Horobet A, Vrinceanu G, Hurduzeu G, Lupu R (2020) Financial Literacy in Romania: A Test of Economics and Business Students. *Studies in Business and Economics* 15: 269–286. <https://doi.org/10.2478/SBE-2020-0058>.
- Hox JJ, Moerbeek M, van de Schoot R (2017) *Multilevel Analysis: Techniques and Applications*. Third Edition. <https://doi.org/10.4324/9781315650982>.
- Jonker N, Kosse A (2022) The interplay of financial education, financial inclusion and financial stability and the role of Big Tech. *Contemporary Economic Policy* 40: 612–635. <https://doi.org/10.1111/coep.12578>.
- Kaur D (2023) A Study on Financial Literacy among University Students. *Pacific Business Review International* 16: 104–115.
- Khalisharani H, Rahmayani Johan I, Fazli Sabri M (2022) The

- Influence of Financial Literacy and Attitude Towards Financial Behaviour Amongst Undergraduate Students: A Cross-Country Evidence. *Pertanika J. Soc. Sci. and Hum* 30: 449–474. <https://doi.org/10.47836/pjssh.30.2.03>.
- Kolachev NI, Rutkovskaya EL, Kovaleva GS, Polovnikova AV (2021) Predictors of Russian Students' Financial Literacy: The PISA 2018 Results. *Voprosy Obrazovaniya / Educational Studies Moscow* 2021: 166–186. <https://doi.org/10.17323/1814-9545-2021-4-166-186>.
- Le Fur E, Outreville JF (2022) Financial literacy, education and risk aversion: a survey of French students. *Managerial Finance* 48: 1530–1543. <https://doi.org/10.1108/MF-10-2021-0509>
- Lone UM, Bhat SA (2022) Impact of financial literacy on financial well-being: a mediational role of financial self-efficacy. *Journal of Financial Services Marketing* 29: 1–16. <https://doi.org/10.1057/S41264-022-00183-8/TABLES/4>.
- López J, Mugno A, Jay W (2019) Educación financiera una alternativa para promover cambios significativos en la calidad de vida de la sociedad colombiana. *Revista Ad-Gnosis* 8: 2344. <https://doi.org/10.21803/adgnosis.v8i8.358>.
- López-Lapo JL, Paredes-Malla MV, Hernández-Ocampo SE (2021) Capacidad de ahorro en los estudiantes de pregrado: enfoque empírico. *593 Digital Publisher CEIT* 6: 102–110. <http://doi.org/10.33386/593dp.2021.4.633>
- Lusardi A, Mitchell OS (2023) The Importance of Financial Literacy: Opening a New Field. *Journal of Economic Perspectives* 37: 137–154. <https://doi.org/10.1257/JEP.37.4.137>.
- Marinov K (2020) Financial literacy and financial behavior of bulgarian students. *Strategies for Policy in Science and Education-Strategii Na Obrazovatelna I Nauchna Politika* 28: 392–418.
- Markle G (2019) Crushing Debt or Savvy Strategy? Financial Literacy and Student Perceptions of their Student Loan Debt. *Journal of Student Financial Aid* 49. Article 4. <https://doi.org/10.55504/0884-9153.1651>.
- Mena-Campoverde C (2022) Alfabetización financiera en jóvenes en Ecuador: Modelo de medición y sus factores determinantes. *Información Tecnológica* 33: 81–89. <http://dx.doi.org/10.4067/S0718-07642022000100081>.
- Méndez-Prado SM, Rodríguez V, Peralta-Rizzo K, Everaert P, Valcke M (2023) An Assessment Tool to Identify the Financial Literacy Level of Financial Education Programs Participants' Executed by Ecuadorian Financial Institutions. *Sustainability (Switzerland)* 15: 996. <https://doi.org/10.3390/SU15020996/S1>.
- Morgan PJ, Long TQ (2020) Financial literacy, financial inclusion, and savings behavior in Laos. *Journal of Asian Economics* 68: 101197. <https://doi.org/10.1016/j.asieco.2020.101197>.
- Morvai J, Ormos M, Antalík I, Mura L, Páldi A, Szabó B (2022) Financial planning in Slovakia: results of empirical research. *Entrepreneurship and Sustainability Issues* 10: 572–589. [https://doi.org/10.9770/JESI.2022.10.2\(36\)](https://doi.org/10.9770/JESI.2022.10.2(36)).
- Moreno-García E, García-Santillán A, Gutiérrez-Delgado L (2017) Nivel de educación financiera en escenarios de educación superior. Un estudio empírico con estudiantes del área económico-administrativa. *Revista Iberoamericana de Educación Superior* 8: 163–183. <https://www.redalyc.org/articulo.oa?id=299151245009>.
- Muguerza, E, Garcia-Salirrosas E, Villar M, Fernandez I (2023) Versión en español de una escala para evaluar la calidad de vida laboral de docentes: Una adopción del mercado QWL de Walton al contexto. *MDPI. Behavioral Sciences* 13: 982. <https://doi.org/10.3390/bs13120982>.
- Murugesan TK, Asis ER, Jaheer JM, Calderón JV, Guerrero FJ, Picon JC, Diaz GP (2022) Developing and Validating Constructs: A Pragmatic Measurement of Financial Inclusion as a Tool for Sustainable Growth. *Sustainability* 14: 12955. <https://doi.org/10.3390/su142012955>.
- Nguyen HT (2019) Development and Validation of a Women's Financial Self-Efficacy Scale. *Journal of Financial Counseling and Planning* 30: 142–154. <https://doi.org/10.1891/1052-3073.30.1.142>.
- Pérez A, Cruz JA, Gómez AM (2018) Situación actual de la educación financiera en jóvenes universitarios de Villavicencio Colombia. *Revista GEON* 5: 115–130. <https://doi.org/10.22579/23463910.79>.
- Pietrantonio KR, Garriott PO (2017) A plan for addressing the student debt crisis in psychological graduate training: Commentary on “graduate debt in psychology: A quantitative analysis” (Doran et al., 2016). *Training and Education in Professional Psychology* 11: 94–99. <https://doi.org/10.1037/TEP0000151>.
- Rangchian M, Nezami S, Jafari Seresht D, Larki-Harchegani A (2020) Pharmacy students' level of financial literacy and its differences among students with various career intentions. *Currents in Pharmacy Teaching and Learning* 12: 671–679. <https://doi.org/10.1016/J.CPTL.2019.10.008>.
- Ravikumar T, Suresha B, Prakash N, Vazirani K, Krishna TA (2022) Digital financial literacy among adults in India: measurement and validation. *Cogent Economics and Finance* 10: 213263. <https://doi.org/10.1080/2322039.2022.2132631>.
- Salas-Velasco M (2022) Causal Effects of Financial Education Intervention Aimed at University Students on Financial Knowledge and Financial Self-Efficacy. *Journal of Risk and Financial Management* 15: 284. <https://doi.org/10.3390/jrfm15070284>.
- Vieira KM, Delanoy MM, Potrich ACG, Bressan AA (2021) Financial Citizenship Perception (FCP) Scale: proposition and validation of a measure. *International Journal of Bank Marketing* 39: 127–146. <https://doi.org/10.1108/IJBM-06-2020-0316>.
- Vijaykumar JH (2022) The Association of Financial Socialization with Financial Self-Efficacy and Autonomy: A Study of Young Students in India. *Journal of Family and Economic Issues* 43: 397–414. <https://doi.org/10.1007/s10834-021-09797-x>.
- Yang B, Lester D (2016) Validating the Executive Personal Finance Scale with Financial Investments and Expectations in University Students. *Psychological Reports* 118: 804–809. <https://doi.org/10.1177/0033294115625581>.
- Wong EE, Burneo RR (2019) Educación financiera papel importante en la formación de profesionales en la región de Tacna. *Iberoamerican Business Journal* 2: 4–19. <http://dx.doi.org/10.22451/5817.1bj2019.vol2.2.11019>.
- Zapata-Aguilar A, Cabrera-Ignacio E, Hernández-Arce J, Martínez-Morales J (2016) Educación financiera entre jóvenes universitarios: Una visión general. *Revista Administración y Finanzas* 3: 1–8 https://www.econfan.org/bolivia/researchjournals/Administracion_y_Finanzas/vo13num9.