Financial Education and Working Capital Management in Micro and Small Enterprises in Peru – 2025

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Abstract: - Financial education is fundamental for efficient working capital management within micro and small enterprises (MSEs) in the service sector. The study aims to determine the influence of financial education on working capital management in MSEs in the service sector of the Avelino Wholesale Market – Arequipa 2025. The research employed a quantitative, basic approach with an explanatory scope and a non-experimental, cross-sectional design. The study sample comprises 200 micro and small enterprises (MSEs) located in the Avelino Wholesale Market, Arequipa, Peru. The survey and questionnaire were used as data collection techniques and instruments.

Key-Words: - Financial education, working capital management, micro and small enterprises, business management, financial literacy, Peru, service sector, MSEs.

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1 Introduction

Financial training is crucial for effective working capital management in micro and small enterprises (MSEs) within the food sector. Globally, small and medium-sized enterprises are the main drivers of economic development, especially in developing economies. This is the case in India, where these companies contribute about 30% of the country's GDP. However, the development of these companies is restricted due to the difficulty of obtaining Financing and poor financial education, [1]. Micro, small, and medium-sized enterprises (MSMEs) are predicted to make up over 99% of all companies in Peru's formal business sector by 2025. Particularly in regions like Lima, Arequipa, and La Libertad, which are home to the greatest number of these industrial units, this sector had an almost 6.8% growth in 2022 over the prior year, suggesting a slow recovery. Given that just 29% of these businesses were able to secure credit in 2021—a trend that showed a minor decline in 2025—their access to formal financing is still restricted despite their economic significance. In terms of taxes, MSMEs provided roughly S/3.996 billion for Third Category Income Tax, or 12.2% of the total collected, and 22.6% for General Sales Tax (IGV), or roughly S/10.272 billion. Manufacturing and construction come in second and third, respectively, after commerce and services, which account for 44.6% and 40.7% of the total. With women leading 43.1% of formal MSMEs and a greater prevalence in the commercial sector, it is noteworthy that women are heavily represented in the management of these businesses, [2]. This information highlights both the relevance and the challenges faced by MSMEs in Peru's current economic landscape, particularly in terms of access to finance and geographical concentration. Similarly, according to regional distribution, formal MSMEs predominate in Lima, with 45.3%, followed by Arequipa with 5.8% and La Libertad with 5.3%, according to data provided by the General Office of Impact Assessment and Economic Studies (OGEIEE), [2]. These industrial units have a significant economic impact, hence their managers need to be properly educated in finance. Programs and training aimed at improving business knowledge must be implemented in this context in order to facilitate more accurate decision-making within entities, [3].

In terms of working capital management, [4] highlights that poor management might cause businesses to grow more slowly. Regarding [5], they found that in the Chinese scenario, factors including the financial manager's age, education, and experience had a direct impact on how well resources are managed, with private businesses exhibiting higher levels of effectiveness than state-owned ones.

The effectiveness of the actions performed is limited since some entrepreneurs have little interest in obtaining financial training, despite the existence of training programs, [6].

This carelessness results in improper activities that affect the financial balance sheet and make it difficult to recover money or fulfill immediate obligations, [7]. In this regard, it has been demonstrated that financial education improves profitability in addition to increasing liquidity, [8], [9].

It's also important to remember that effective working capital management involves both technical expertise and strategic thinking in the face of unstable finances. [10] suggests that MSMEs with financially trained management can adapt more effectively to changes in government policy or supply chain disruptions.

At the Avelino wholesale market in Arequipa, interviews with grocery store owners reveal constant failures in financial management, particularly in inventory replenishment, payments to suppliers, and bank credit management. Despite having access to Financing in some cases, problems persist in meeting commitments. This situation highlights the importance of investigating how financial education influences working capital management in these businesses.

This study, therefore, poses the following question: How will financial education impact working capital management in MSMEs in the supply sector at the Avelino wholesale market in Arequipa in 2025?

1.1 Financial Education

Financial education is recognized as a crucial component in a company's management and decision-making process, facilitating the development of effective resource management strategies. Additionally, a financial study assesses the company's current economic and financial condition, identifying areas where investment is needed or where unnecessary expenses exist, as noted in [11]. Furthermore, it is crucial to begin financial education from childhood, with the aim of educating future entrepreneurs who can assess risks and advantages when making decisions about financing alternatives, savings, investments, and other capital management operations, [12]. It is also essential for entrepreneurs to understand the market context, develop business planning tactics, maintain proper accounting, and manage tax risks effectively. Its relevance is based on the fact that it contributes significantly to the development and success of their business projects, [11]. It is crucial to note that, in Peru, according to the results of the National Survey of Financial Capabilities – 2023, conducted by the Development Bank of Latin America (CAF), together with the Superintendency of Banking, Insurance, and Pension Fund Administrators of Peru (SBS, for its Spanish acronym), reveal that 45% of Peruvians have an average level of financial education, 14% have an adequate level, and 41% have no financial skills. Additionally, 53% of Peruvians engage in financial planning, compared to only 43% who participate in savings activities, [13].

For greater transparency, accuracy, and a thorough examination of financial education, the following dimensions are presented:

- Planning: Planning involves defining a series of guidelines for activities to be carried out internally within the administration process. This procedure includes elements such as goals, strategies, and processes. The objective of this procedure within the organization is to reduce expenses, optimize resource utilization, increase productivity, and effectively manage administrative tasks, [14].
- Savings: According to [15], savings are understood to be the sum of money or goods that people set aside and reserve for future use, motivated by different reasons and using different techniques. This can include money kept at home, resources stored in the financial system or in informal entities, and even property. Savings are directly related to financial education and represent a crucial component in businesses for maintaining a balanced and sustainable financial life. Therefore, a lack of information leads to limited economic opportunities, [16].
- Financing: Obtaining Financing in various economic sectors of the country is essential for their persistence and growth in the market, as it provides access to cash to be used in commercial activities and achieve superior returns. However, several obstacles hinder access to Financing for MSMEs, preventing them and the financial market from interacting effectively with each other, [17].

1.2 Working Capital Management

Working capital management (WCM) is defined as the functional administration of a company's current assets and current liabilities, ensuring a balance that maximizes liquidity without sacrificing profitability, [18]. In the context of MSEs, where access to capital markets is restricted, WCM becomes the primary tool for financial survival. Mismanagement

of these resources leads to "technical insolvency," where a business may be profitable on paper but fails in practice due to a lack of immediate cash to cover its obligations, [19].

To provide a rigorous analysis, this study deconstructs WCM into three specialized dimensions, directly influenced by the entrepreneur's financial literacy:

- **Cash Management (EFECT):** The Liquidity Pillar. Cash is the most liquid but non-productive asset. Effective management does not mean having "more cash," but rather optimizing the "Cash Conversion Cycle" (CCC). In the Avelino Wholesale Market, MSEs operate in a high-velocity environment where most transactions are settled in physical currency. Therefore, cash management involves sophisticated forecasting of daily inflows and outflows to avoid "idle cash" (which loses value due to inflation) or "cash stockouts" (which halt operations). A financially educated manager uses these reserves not just for payments, but as a strategic buffer against market volatility, [20].
- **Inventory Administration (EXIST**): The Capital Accumulation Pillar.
  In the commerce and service sector, inventory often represents more than 50% of total current assets. This dimension is not merely about counting products; it involves managing "Inventory Turnover" and "Economic Order Quantity" (EOQ). Poor inventory management in Peruvian MSEs often results in "Dead Stock" (expired or obsolete products) or "Stockouts" (loss of sales). A manager with robust financial education understands the "Inventory Carrying Cost"—which includes storage, insurance, and opportunity cost—and uses this knowledge to align stock levels with actual market demand, thereby freeing up capital for other investments, [21].
- **Trade Credit and Supplier Management (MANEJ): The Financing Pillar.**
  This is perhaps the most critical dimension for micro-enterprises. Trade credit (accounts payable) is essentially an "interest-free loan" granted by suppliers. Strategic management of this dimension involves negotiating extended payment terms while ensuring prompt collection of accounts receivable. In emerging economies like Peru, MSEs that lack access to formal bank credit must rely on trade credit as their primary source of leverage. Financial literacy allows the entrepreneur to understand the "Cost of Forgoing a Cash Discount" and the importance of "Reputational Capital" with suppliers to secure better credit terms, which is vital for maintaining a healthy working capital ratio without increasing financial debt, [22], [23].

2 Methodology

The study employs a quantitative method, which enables the analysis of the phenomenon in question by investigating the statistical relationships between variables within a specific context. This perspective is relevant when seeking not only to detail a phenomenon, but also to explain and understand the connection between different variables in a specific context, [24].

In this research, quantitative analysis facilitated the investigation of statistical relationships between variables in the consumer goods industry, specifically within the context of the Avelino Cáceres wholesale market in Arequipa.

Since the goal of this study is to develop theoretical information about how financial education affects working capital management without looking for immediate application, it is categorized as basic in nature, [25].

In terms of study scope, it takes an explanatory position, seeking to identify causal relationships between variables and the contexts in which they manifest, [26].

To reach certain results, a deductive process was used, starting with general principles. This procedure facilitates the comparison of theory with the information collected, enabling logical deductions based on the established theoretical framework, [27]. Additionally, the study design was non-experimental and cross-sectional in nature, given that the variables were not altered and data collection was carried out at a single point in time, [24], [27].

Population and sample

The population of interest in this research consisted of 200 micro and small enterprises (MSEs) engaged in grocery trading in the Avelino Cáceres wholesale market. The sample, chosen through simple random sampling, included 200 of these companies, which are both the unit of analysis and observation. This type of sampling ensures that each element of the population has an equal chance of being selected, thereby reducing bias in the selection process, as cited in [24], [27].

Techniques and instruments

Information was collected using a survey method, with a structured questionnaire explicitly designed

to assess the dimensions of the variables under study. This tool was created after a review of the literature and modified for the MSMEs in the market that was being studied.

While working capital management encompassed cash, inventory, and commercial credit management, financial education covered aspects of financing and savings. A five-point ordinal scale (ranging from "totally adequate" to "inadequate") was used to assess the variables, [28].

Three experts in methodology and applied research were among the specialists who evaluated the validity of the instrument; 95% agreement was observed, [29].

Data management was performed using SmartPLS version 4, a specialized program for studying structural equations based on partial least squares in structural equation modeling (PLS-SEM). This methodology facilitates the modeling of links between latent variables and the observation of the impact of various constructs on dependent variables, making it appropriate for small samples and data that do not follow a normal distribution, [30], [31].

In this regard, the algorithmic evolution of latent variable path modeling has enabled the consolidation of more robust estimates in environments characterized by high structural complexity, optimizing the consistency of weights and factor loadings during the iterative stages of the analysis, [32].

PLS-SEM, initially developed by Herman Wold in the 1980s and later extended for structural equation modeling, is a multivariate approach focused on predicting and explaining complex models with causal links between observed and latent variables. This method was chosen for its versatility in handling small samples, as well as for its effectiveness in formative and reflective models, and in exploratory research and real market contexts, [30], [33].

The reliability indicators (composed of rho_a and rho_c), convergent validity (AVE), and discriminant validity [31], were evaluated. In addition, Pearson correlation studies were performed, and the explanatory power of the model was assessed using the R^2 coefficient and the f^2 effect, in accordance with the suggestions in [30].

The following are the dimensions and indicators:
Financial education:

- Savings: financial reserve planning and objectives (segments: AHC1, AHM1, AHL1, AHL2).
- Finance: including aspects of interest rates and compliance with credit obligations (CT1, GP1).

Working capital management:

- Cash: generating cash flow and reserve capacity (ME1, DE1, DE2).
- Inventory: inventory management and turnover (RI1, RI2).
- Trade credit management: supplier relations and payment compliance (PP1, PP2).

To measure the variables of financial education and working capital management, the following five-point ordinal scale was used (Table 1).

Table 1. Measurement scales

Alternatives	Scales
A	Totally adequate
B	Adequate
C	Moderately adequate
D	Somewhat inadequate
E	Inadequate

Source: Own elaboration

According to Table 4, the validity of the instruments was verified through expert review, involving three experts with extensive knowledge in the field of research. The expert evaluation gave the instruments a 95% validity rating, determining that they were suitable for use.

To this end, both a general hypothesis and specific hypotheses are proposed to facilitate a better analysis and understanding of the collected information.

General hypothesis

- Financial education has a positive influence on the working capital management of micro and small enterprises in Peru.

Specific hypotheses

- Savings have a positive impact on the cash flow of MSEs in Peru.
- Savings have a positive impact on the inventories of MSEs in Peru.
- Savings have a positive impact on the commercial credit management of MSEs in Peru.
- Finances have a positive impact on the cash flow of MSEs in Peru.
- Finances have a positive impact on the inventories of MSEs in Peru.

- Finances have a positive impact on the commercial credit management of MSEs in Peru.

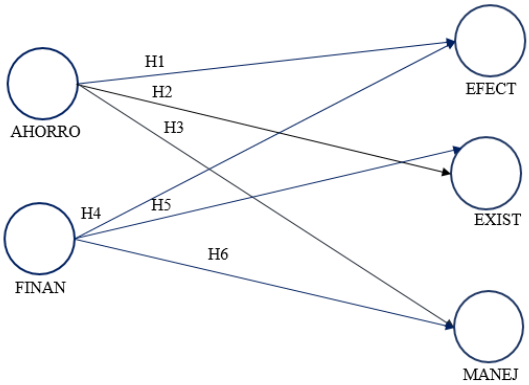

Fig. 1: Proposed Conceptual Model of the Relationship between Financial Education and Working Capital Management and Hypotheses.
Source: Created by the author using SmartPLS, it shows the hypothetical relationship between the dimensions of financial education and those of working capital management

The computational complexity of the structural model presented in Figure 1 is determined by the iterative nature of the Partial Least Squares (PLS-SEM) algorithm. Unlike covariance-based SEM, the PLS algorithm follows a two-stage process:

- Iterative Estimation of Latent Variable Scores: The model processes a series of ordinary least squares (OLS) regressions. The complexity for this stage is O(k * n * i), where k is the number of constructs (5 in this model), n is the sample size (200), and i is the number of iterations until convergence (typically less than 300).
- Bootstrapping Procedure: To validate the hypotheses (H1 to H6), a non-parametric bootstrapping was performed with 5,000 subsamples. The computational load for this process increases to O(B* k* n), where B represents the number of resamples.

This approach ensures that the model can handle the non-normal distribution of data often found in MSEs of the Avelino Wholesale Market, providing stable estimates even with high model complexity relative to the number of indicators, [30].

For the research itself, according to Table 2 it is necessary to determine which abbreviation will be used to characterize each dimension, ensuring a more transparent process and a practical understanding of the tables during testing of the proposed hypotheses.

Table 2. Description, assessment, and abbreviation of the variables in the structural model

Variable	Description	Notes	Abbreviation
X1	Savings	Grading from A to E	AHORRO
X2	Financing	Grading from A to E	FINAN
Y1	Cash	Grading from A to E	EFECT
Y2	Inventory	Grading from A to E	EXIST
Y3	Commercial credit management	Grading from A to E	MANEJ

Source: Own elaboration based on SmartPLS 4 results

Data analysis

A quantitative statistical study was conducted to evaluate the correlation between variables, utilizing correlations and regressions, a method that facilitates the analysis of connections between observable and unobservable variables. First, Pearson's correlation was applied to explore the connection between elements, revealing moderate to high intensity positive links, indicating internal consistency between the elements of the questionnaire.

Metrics including average variance extracted (AVE), composite reliability, and external factor loadings (more than 0.70) were then used to assess convergent validity. Every construct surpassed the minimal thresholds needed, demonstrating the model's validity and dependability. These results imply that the data gathered is adequate for the suggested structural analysis and that the tool employed is appropriate for illustrating the theoretical ideas being examined.

Convergent validity was assessed using:

- External loads (>0.70).
- Reliability composition (rho_a and rho_c) (>0.70).
- Average extracted variance (AVE) (>0.50).

Data processing was performed using SmartPLS software, which enabled the development and

confirmation of the conceptual model presented in the research hypothesis.

2.1 Evaluation of Structural Models

This chapter presents the main findings derived from the analysis of the data collected in relation to the variables of financial literacy and working capital management, as well as their corresponding dimensions. Statistical treatment, performed using the structural equation modeling (SEM) approach with SmartPLS software, enabled us to examine the connections and interactions between latent variables and validate the proposed model's structure.

As shown in Table 3 (Appendix), the results of the convergent validity analysis indicate that all constructs meet the minimum criteria established. First, external loadings must be greater than 0.70 to be considered acceptable; in this case, all exceed this threshold, with values between 0.842 and 0.940, confirming a strong relationship between the items and their respective factors.

Compound reliability (rho_c) must also exceed 0.70 to ensure internal consistency. All constructs meet this criterion: for example, the Alpha for Savings is 0.891 and its rho_c is 0.924; while the construct with the lowest values, Financing, is also adequate (alpha = 0.781; rho_c = 0.901).

Similarly, the construct must contribute more than half of the variance of its items if the average extracted variance (AVE) is more than 0.50. With values ranging from 0.742 (Cash) to 0.878 (Commercial Credit Management), all of the AVEs in this investigation significantly above this cutoff, which supports the model's quality.

To sum up, the statistical indicators show that every concept has strong convergent validity, which supports the employed instrument's internal consistency and dependability.

Table 4. Discriminant validity by criterion (Fornell-Larcker)

	Savings	**Cash**	**Inventory**	**Financing**
Savings	0.867			
Cash	0.853	0.861		
Inventory	0.763	0.774	0.923	
Financing	0.819	0.846	0.834	0.905
Commercial credit management	0.669	0.767	0.860	0.858

Source: Own elaboration based on model data. Diagonal values are the square roots of the AVE.

According to Table 4, discriminant validity is a crucial criterion in evaluating measurement models, as it verifies whether constructs that are intended to be distinct from one another are indeed distinct in empirical terms, [30]. One of the most widely accepted methods for evaluating this property is the reasoning of [30], which establishes that a construct must have more variance shared with its own components than with those of other constructs.

Specifically, this criterion requires that the square root of the average extracted variance (AVE) of each construct be greater than the correlations between that construct and any other in the model, [31], [30]. This comparison allows us to determine whether the constructs are independent, ensuring that each individual evaluates a single concept within the model.

Table 5. VIF (variance inflation factor) for each measured variable

Savings			
AHC1	AHL1	AHL2	AHM 1
2.856	2.406	2.096	2.657
Financing			
CT1	GP1		
1.695	1.695		
Cash			
DE 1	DE 2	ME 1	
2.306	1.702	1.936	
Inventory			
RI 1	RI 2		
2.000	2.000		
Commercial credit management			
PP1	PP2		
2.337	2.337		

Source: Own elaboration

2.1.2 Collinearity

Another important assumption to consider when estimating a structural model is the absence of Collinearity among the components used for the formative measurement of each latent variable. Collinearity, also known as multicollinearity, occurs when two or more variables we use to predict something are closely related to each other. This means that one variable can be predicted using the others. To determine whether there is Collinearity, a measure called the Variance Inflation Factor (VIF) is used. The VIF tells us how much the variance of a result is inflated due to Collinearity.

We must verify that there is no excessive collinearity between the predictor variables. If VIF<5, there is no collinearity problem, and if VIF>5, there is severe Collinearity, in which case the instrument would have to be eliminated or modified. Collinearity makes it difficult to determine the importance of each variable and can

render the model unreliable. That is why it is important to detect it. Table 5 shows the Variance Inflation Factor. Low values indicate little Collinearity. All VIF data are below 3.30. This means that there are no serious collinearity problems between the variables.

2.2 Descriptive Results

Regarding financial literacy levels, the findings indicate that a significant proportion of MSME owners possess basic knowledge of savings management, although they do not always apply systematic methods to manage their finances. Approximately 65% of those surveyed reported that they consistently detail their income allocated to savings, while 38% claim to evaluate their financial results regularly.

Table 6. Descriptive statistics for key items by dimension

Variable / Dimension	Items (Key Indicators)	Mean	SD	Range
Financial Education Savings (AHORRO)	AHC1, AHM1, AHL1, AHL2	3.42	1.34	1-5
Financing (FINAN)	CT1, GP1	3.28	1.15	1-5
Working Capital Management				
Cash (EFECT)	ME1, DE1, DE2	3.35	1.11	1-5
Inventory (EXIST)	RI1, RI2	3.48	1.22	1-5
Trade Credit Mgt. (MANEJ)	PP1, PP2	3.15	1.08	1-5

Source: SD = Standard deviation. Data processed in Jamovi. Sample: 200 companies. Own elaboration

The descriptive analysis presented in Table 6 reveals a significant gap between the theoretical knowledge and the operational application of financial strategies within the MSEs of the Avelino Wholesale Market. Regarding Financing, it was observed that 54% of businesses rely on informal loans. This high percentage suggests that despite having a basic understanding of credit, a lack of formal financial education leads to a distrust of banking institutions, forcing entrepreneurs into high-risk informal markets that jeopardize their long-term solvency.

In terms of Working Capital Management, the data indicates a disconnect between planning and execution. Although 70% of respondents perform income and expense forecasting, only 46% maintain a structured cash flow. This discrepancy highlights that while there is an intention to plan (Financial Education), there is a lack of technical competence in managing Cash (EFECT), which directly impacts liquidity. Similarly, the absence of computerized systems in Inventory (EXIST) control—relying instead on manual counts—explains why the relationship between savings and stock levels was not statistically significant in the structural model; the management is reactive rather than strategic.

To address these limitations, future research could integrate these empirical findings with advanced simulation methodologies, such as System Dynamics or Monte Carlo Simulation. While the current PLS-SEM model provides a static correlation, a simulation-based approach would allow for the modeling of stochastic variables—such as sudden shifts in supplier credit terms or inflationary pressures on inventory costs. Combining the structural rigor of this study with dynamic simulation would enable MSEs to transition from manual, traditional management to a proactive, "what-if" scenario analysis, significantly reducing the risk of technical insolvency in volatile emerging economies.

3 Results of the Model (SEM)

According to the statistical results derived from the analysis of the database, conducted using Jamovi software, the Structural Equation Model (SEM) was applied with the following parameters:

- Sample: 200 MSMEs (N = 200)
- Structural model: WC ~ FE (Working Capital Management as a function of Financial Education)
- Estimation method: DWLS (Diagonal Weighted Least Squares)

Note: The SEM model was applied to a subsample of 200 MSMEs, randomly selected due to the statistical conditions required for estimating the structural model. However, the total sample for the study comprised 200 MSMEs from the service sector of the Avelino wholesale market in Arequipa. As shown, the indices indicate a good fit between the model and the analyzed data.

According to Table 7, the SEM analysis confirmed a positive and demonstrable relationship between financial education and working capital management. All dimensions' outer factor loadings were higher than the 0.70 criterion, indicating that each construct is sufficiently represented by the items.

Table 7. Results of the structural model (PLS-SEM)

Hypotheses	Sample mean (M)	Standard deviation (STDEV)	Path coefficient	t-statistics (|O/STDEV|)	p-value	Decision
H1: SAVINGS -> EFECT	0.478	0.173	0.487	2.816	0.005	H1: Accepted
H2: SAVINGS -> EXIST	0.242	0.176	0.241	1.372	0.170	H2: Rejected
H3: SAVINGS -> MANEJ	-0.109	0.160	-0.105	0.658	0.511	H3: Rejected
H4: FINAN -> EFECT	0.455	0.165	0.447	2.702	0.007	H4: Accepted
H5: FINAN -> EXIST	0.636	0.159	0.637	4.014	0.000	H5: Accepted
H6: FINAN -> MANEJ	0.952	0.136	0.945	6.952	0.000	H6: Accepted

Source: Own elaboration

The internal consistency of the model was further reinforced by reliability coefficients. Furthermore, the Average Variance Extracted (AVE) exceeded the threshold of 0.50, guaranteeing adequate convergent validity.

The hypothesis that more effective financial education is linked to more effective working capital management among MSMEs in the Avelino Cáceres market was confirmed by the statistically significant ($p < 0.05$) association between key variables. This suggests that financial knowledge and skills have a positive impact on economic decision-making and operational performance within these enterprises.

As illustrated in Figure 2, the results obtained through Structural Equation Modeling (SEM), presented in Table 6, enable the interpretation of the relationship between Financial Education (FE) and Working Capital Management (WCM). First, it was determined that savings exert a positive and significant impact on cash availability (path coefficient = 0.487; t = 2.816; p = 0.005), indicating that an increase in resource accumulation contributes to higher cash levels within the organization or the studied context. However, regarding the relationships between savings and inventory levels, as well as the management of trade credit, the results did not show statistical significance.

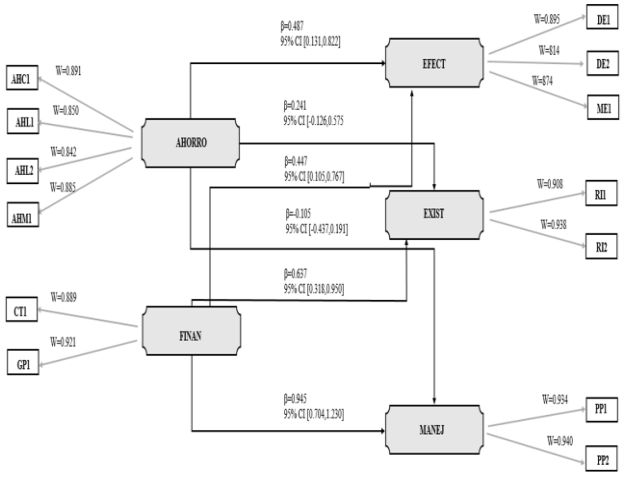

Fig. 2: Structural Model: Relationship Between Financial Education and Working Capital Management

Note: The model reveals a significant relationship between Financial Education and Working Capital Management ($\beta = 0.994$, $p < 0.001$), with strong fit indices: CFI = 1.000, RMSEA = 0.066, and SRMR = 0.090

Source: Created by the author using SmartPLS4

With a t-value of 1.372, a p-value of 0.170, and a coefficient of 0.241, the link between savings and inventory indicates that while the trend is favorable, there is not enough data to confirm that savings have a direct impact on inventory levels. Similarly, there was a negative correlation (coefficient of -0.105, t-value of 0.658, p-value of 0.511) between trade credit management and savings. This implies that savings have no impact on managerial capability and may even restrict administrative freedom in some situations.

Conversely, financial factors exhibit a favorable and statistically significant impact on all assessed characteristics. A strong financial structure improves cash availability, according to the association between finance and cash, which produced a coefficient of 0.447 (t = 2.702; p = 0.007). The coefficient for inventory reached 0.637 (t = 4.014; p = 0.000), indicating that funding is essential to maintaining system stability and continuity.

Finally, the most significant relationship was observed between finance and trade credit management, with a coefficient of 0.945 (t = 6.952, p = 0.000), suggesting that sound financial management substantially improves the management of commercial credit.

Additionally, the R^2 test results confirm that the model has a strong explanatory capacity for the dependent variables.

Table 8. Test R2

Effects on endogenous variables	R^2
Cash	0.793
Inventory	0.715
Commercial credit management	0.741

Source: Own elaboration

Table 8 shows that the construct CASH (EFECT) has an R^2 value of 0.793, indicating that the model's independent variables explain 79.3% of its variance. Its adjusted R^2 is 0.779, which accounts for potential effects related to sample size or the number of predictors. Similarly, INVENTORY (EXIST) presents an R^2 of 0.715, meaning that 71.5% of its behavior is attributable to directly influencing variables.

As for TRADE CREDIT MANAGEMENT (MANEJ), its R^2 is 0.741, reflecting 74.1% of explained variance and highlighting the model's robustness in this area.

Overall, all R^2 values substantially exceed the minimum threshold of 0.10 recommended for explanatory models in PLS-SEM, and fall within the range of significant effect sizes (above 0.67), indicating a strong predictive and explanatory capacity of the proposed model.

3.1 The Effect of Latent Variables

The relationship between two latent constructs, Financial Education (FE) and Working Capital Management (WCM), was examined: FE → WCM. The analysis revealed that Financial Education has a significant impact on Working Capital Management. An increase of one standard deviation in Financial Education is expected to result in a 0.994 standard deviation increase in Working Capital Management, thereby confirming the proposed hypothesis.

All factor loadings were statistically significant; the variance of FE (0.707, $p < 0.001$) supports the validity of the indicators used in this statistical model. In contrast, the variance of WCM was not significant (0.010, $p = 0.562$), suggesting that most of its variation is attributable to Financial Education.

The results demonstrate that financial education has a real influence on MSMEs' management and is not just a theoretical concept. More specifically, more efficient working capital management is closely related to skills like organizing savings, analyzing financial products, and assessing financing options.

The structural model revealed that trade credit management (GCapt_Item27) and financial planning (Educafin_Item9) were the most important dimensions. These results align with previous studies [4], [34], and [35], who emphasize the importance of financial literacy in the sustainable development of micro and small enterprises.

Statistically, it was confirmed that financial education accounts for nearly all the variation observed in working capital management, as evidenced by the significant variance of the FE construct ($p < 0.001$), in contrast to the non-significant variance in WCM ($p = 0.562$).

Based on the statistical requirements for structural model estimation, the SEM model was applied to a randomly chosen subsample of 200 MSMEs. However, 200 MSMEs from the service sector of Arequipa's.

Hypothesis 1: The cash flow of MSEs in Peru benefits from savings.

This theory was approved, proving that a rise in savings capacity strengthens operational liquidity by favorably affecting cash availability. The study found a statistically significant link with a path coefficient of 0.487, a t-statistic of 2.816, and a p-value of 0.005.

This result is consistent with the study of [36], who found a somewhat favorable association ($r = 0.692$) between economic growth and a financial savings culture among MSMEs in Trujillo, Peru. In a similar vein, [37] emphasizes how financial education improves savings patterns among micro-entrepreneurs in Mexico's restaurant industry through behavioral economics methodologies.

Hypothesis 2: In Peru, savings have a favorable effect on MSE inventories.

The hypothesis was disproved, suggesting that decisions pertaining to inventory are neither directly or significantly impacted by savings. With a t-value of 1.372 and a p-value of 0.170, the model's path coefficient of 0.241 indicates that statistical significance was not attained.

This result is in line with research by [38], [39], who discovered that savings levels had little effect on inventory management among Lima's textile MSMEs. Rather, it turned out that technical instruction in logistics administration was more important.

Similarly, [40] concluded, in their study of commercial enterprises in China, that working capital and inventory turnover are more closely linked to procurement practices than to personal savings strategies.

Hypothesis 3: Savings have a positive impact on the commercial credit management of MSEs in Peru.

Moreover, the hypothesis was rejected, indicating that savings do not contribute significantly to trade credit management. In the study, the path coefficient reached a value of -0.105, with a t-statistic of 0.658 and a p-value of 0.511, suggesting a non-significant and even negative correlation.

This finding is consistent with research by [41], who reported that trade credit management in family-owned businesses in Ecuador is more influenced by external financing policies than by internal savings reserves.

Similarly, studies by [42], [43] found a negative correlation between personal savings and efficient credit management in urban microenterprises in southern Colombia, mainly due to limited access to formal banking services.

Furthermore, this disconnect aligns with observations regarding Peruvian micro-enterprises in the commercial sector, where profitable management and the control of supplier obligations depend critically on operational turnover rather than the static accumulation of internal funds, [44]. This reinforces traditional trade credit theories, which posit that supplier financing operates based on reputation dynamics and institutional market incentives, rendering personal savings strategies insufficient for securing flexible payment terms, [45].

Hypothesis 4: Finances have a positive impact on the cash flow of MSEs in Peru.

This hypothesis was accepted, demonstrating that an adequate financing structure ensures the availability of resources for daily operations, thereby increasing liquidity. Statistical significance was confirmed by the model's path coefficient of 0.447, t-statistic of 2.702, and p-value of 0.007.

[39] discovered that among footwear MSMEs in El Porvenir, Peru, funding sources are associated with 11.3% of firm survival, highlighting the significance of financing in efficient cash management.

Hypothesis 5: Finances have a positive impact on the inventories of MSEs in Peru.

The acceptance of the hypothesis shows that financing makes it possible to acquire and maintain optimal inventory levels. A strong and statistically significant association was indicated by the analysis's path coefficient of 0.637, a t-value of 4.014, and a p-value of 0.000.

Inventory management in MSMEs, particularly shoe stores in Chimbote, Peru, was found to have a strong positive link (correlation values ranging from 0.680 to 0.750) by [40]. This implies that proper financing is necessary for efficient stock management. This conclusion is corroborated by [41], who point out that short-term financing lowers stock losses and boosts inventory turnover.

Hypothesis 6: Finances have a positive impact on the commercial credit management of MSEs in Peru.

This was the strongest hypothesis, demonstrating a clear relationship between access to Financing and improved management of credit lines with suppliers and clients. In this study, a path coefficient of 0.945, a t-value of 6.952, and a p-value of 0.000 were obtained, indicating a highly significant and positive relationship.

[46] found that Financing impacts the profitability of MSMEs in the hardware sector in Juliaca, Peru, with 66.7% of business representatives acknowledging such an effect highlighting the importance of Financing in trade credit management.

4 Discussion

The results of this study provide significant empirical evidence on the relationship between financial education and working capital management in the context of Peruvian MSMEs. The structural model (SEM) confirms that financial literacy is not merely theoretical but has a tangible impact on operational decision-making.

4.1 Comparison with Previous Studies

The acceptance of Hypothesis 1 and 4 regarding cash flow confirms that both savings capacity and access to financing are pillars of liquidity. These findings align with [4] and [34], who emphasize that financial literacy is vital for the sustainable development of small enterprises. Specifically, the positive correlation found in this study (path = 0.487) matches the research of [36], who identified that a savings culture strengthens economic growth in Peruvian MSMEs.

On the other hand, the rejection of Hypotheses 2 and 3 is a revealing finding. The fact that savings do not significantly impact inventory or credit management suggests that micro-entrepreneurs in Arequipa might use savings as a personal safety net rather than an operational investment tool. This is consistent with [38] and [39], who found that

inventory management in local MSMEs is more dependent on logistics training than on financial savings. Furthermore, the findings of [40] support this, indicating that inventory turnover in commercial sectors is more closely linked to procurement practices.

Finally, the strong relationship in Hypothesis 6 (path coefficient = 0.945) demonstrates that financial education is most effective when applied to commercial credit management. This result is supported by [42], who found that financing directly impacts the profitability of hardware MSMEs in Peru, and by [41], who note that short-term financing is essential to reduce stock losses and improve credit lines.

4.2 Limitations of the Study

Although the model shows high explanatory power (R^2 values above 0.70), several limitations must be addressed:

- Sample size for SEM: While 200 MSMEs were surveyed, the structural model was estimated using a subsample of 50 units due to the requirements of the DWLS method. Future studies should aim for larger samples to further generalize these results.
- Geographical scope: This research focused specifically on the Avelino Wholesale Market in Arequipa. Therefore, the results may vary in other regions of Peru with different economic dynamics.
- Study design: The cross-sectional nature of the data collection (2025) provides a snapshot of the current situation but does not allow for a longitudinal analysis of how financial education evolves over time.

5 Conclusion

- The study, conducted through Structural Equation Modeling (SEM), confirmed a positive and significant connection between financial education and working capital management among MSMEs in the clothing retail sector of the Avelino wholesale market in Arequipa. The main hypothesis of the study is supported by this statistical connection.
- Within each construct, the items that represented trade credit management and financial planning (Items 27, 28, 33, and 34) for Working Capital Management and savings and financial evaluation (Items 9, 21, and 22) for Financial Education had the highest factor loadings.
- The global fit indices (CFI = 1.000, RMSEA = 0.066, SRMR = 0.090) showed an excellent model fit despite the study's inclusion of 200 enterprises, supporting the suggested theoretical framework.
- The study offers solid empirical proof of the significance of enhancing small business owners' financial capacities as a tactic to boost liquidity, promote inventory control, and guarantee adherence to commercial commitments.
- The results might be a useful tool for creating training programs or governmental policies that are specific to the MSME setting in order to support operational and financial sustainability in this crucial manufacturing sector.

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Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. There are no conflicts of interest to declare.

APPENDIX

Table 3. Convergent validity of constructs (SmartPLS 4)

Variable and item code	Item	External load	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Mean extracted variance (AVE)
Savings			0.891	0.900	0.924	**0.752**
	AHC1 Short-term savings	0.891				
	AHM1 Medium-term savings	0.885				
	AHL1 Long-term savings 1	0.850				
	AHL2 Long-term savings 2	0.842				
Financing			0.781	0.795	0.901	**0.819**
	CT1 Interest rate hedging	0.889				
	GP1 Risk management	0.921				
Cash			0.826	0.836	0.896	**0.742**
	ME1 Cash management	0.874				
	DE1 Cash availability 1	0.895				
	DE2 Cash availability 2	0.814				
Inventory			0.828	0.850	0.920	**0.852**
	RI1 Stock requirement	0.908				
	RI2 Inventory turnover	0.938				
Commercial credit management			0.861	0.862	0.935	**0.878**
	PP1 Payment to suppliers 1	0.934				
	PP2 Payment to suppliers 2	0.940				

Source: Own elaboration based on SmartPLS 4 results