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In the first article we present *Correlation of the performance indicators of MiPyMes in the city of León Guanajuato and their internal attention* by Ordaz-Picón, Carla, Díaz-González, Claudia, Alatorre-Herrera, Raquel and Martínez-Aguilar, Libia, with adscription in the Instituto Tecnológico de León, as the next article we present *Analysis of the Dynamics of Public Policies Aimed at Promoting MSMEs from the Perspective of the OECD Development Index in the Municipality of León, Guanajuato* by Díaz-González, Claudia, Ordaz-Picón, Carla, Alatorre-Herrera, Raquel and Olmos-Méndez, Fátima, with adscription in the Instituto Tecnológico de León, as the next article we present *Analysis of the implementation of POS terminals at the Tecamac food market, state of Mexico* by Hernández, Maribel, Guerrero, Sylja, Colina Rocío and Ortiz Alicia, with adscription in the Universidad Politécnica de Tecamac, as the next article we present *Inclusive activities for children to prevent corruption in Nayarit* by Méndez-Martínez, Myrna & Rábago-De Ávila, Marcela, with adscription in the Universidad Autónoma de Nayarit, as the next article we present *Feasibility and benefit-cost of a digital portal for the agricultural sector* by Zamora-Domínguez, María Elena, Ortega-Montes, Fabiola Iveth, Macías-López, María Guadalupe and Rubio-Áreas, Héctor Osbaldo, with adscription in the Universidad Autónoma de Chihuahua, as the next article we present *Digital Divides and Productive Development in Rural Women: A Systematic Analysis* by Ramos-Marquez, José Eduardo & Jiménez-García, Martha, with adscription in the Instituto Politécnico Nacional, as the last article we present *Women entrepreneurs and the gender gap in business development in the Huasteca Potosina region* by Martínez-Hernández, Mariela Lizeth, Hernández-De la Cruz, Mariana and Bautista-López, Braulio, with adscription in the Instituto Tecnológico Superior de Tamazunchale.

Content

ECORFAN Journal-Republic of Paraguay 11[19]1-9: e11119109
Article

Correlation of the performance indicators of MiPyMes in the city of León Guanajuato and their internal attention

Correlación entre los indicadores de rendimiento de las MiPyMes de la ciudad de León, Guanajuato, y su atención interna

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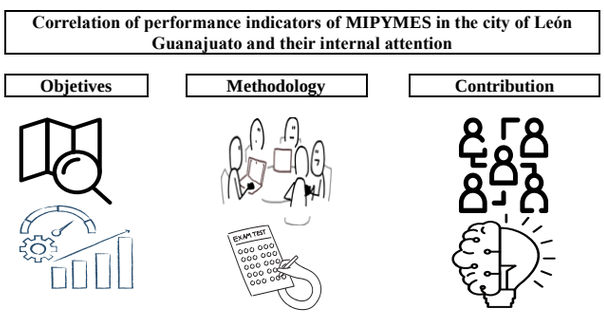
Abstract

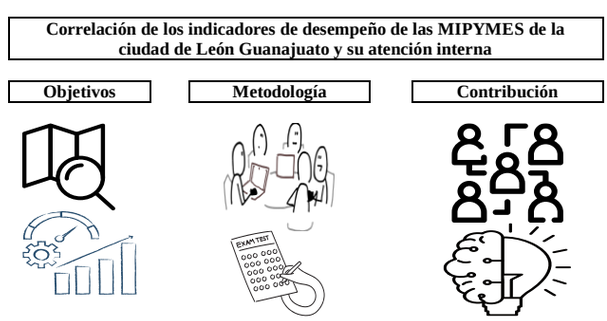
This descriptive correlational study aims to explore the level of performance of MiPyMes based on the Intellectus Model made up of four dimensions (Bueno, 2011) and its alignment with business Megatrends. The Mexican Institute for Competitiveness (IMCO, 2025) ranks León, Guanajuato, 13th in the Urban Competitiveness Index, which requires the constant improvement of performance indicators. The model was adapted to construct a 38 statement Likert-scale instrument: Strongly Agree, Agree, and Disagree. This instrument was applied to 69 MiPyMes of product makers and service providers and was administered to management-level personnel. Data were analyzed using descriptive statistics by grouping and weighting data, followed by nonparametric statistics using a Chi-square (X^2)



Correlation, Analysis, Indicators

Resumen

Este estudio descriptivo correlacional tiene como finalidad explorar el nivel de desempeño de las MiPyMes en base al Modelo Intellectus conformado por cuatro dimensiones (Bueno, 2011) y su alineación a las Megatendencias empresariales. El instituto mexicano para la competitividad (IMCO, 2025) posiciona León Guanajuato en el lugar 13 en el índice de competitividad urbana, lo que obliga a mejorar los indicadores de desempeño constantemente. El Modelo se adaptó para construir un instrumento de 38 afirmaciones con escala Likert: Totalmente de acuerdo, De acuerdo y en Desacuerdo, que fue aplicado en 69 MiPyMes de productos y servicios, la aplicación se realizó al personal con puestos de nivel directivo. Los datos se analizaron mediante estadística descriptiva agrupando y ponderando datos, posteriormente con estadística no paramétrica mediante una prueba de independencia Chi cuadrada (X^2)



Correlación, Análisis, Indicadores

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Introduction

Micro, small and medium-sized enterprises (MiPyMes) are managed under a context of high uncertainty, so it is important to evaluate their performance based on their categorization. The National Institute of Statistics and Geography (INEGI, 2024) is responsible for classifying companies, first defining them as " single-establishment " when they do not share the company name with any other economic unit, or " multi-establishment " when they have more than one establishment or branch, for example, water operators, construction companies, etc., and then classifying them by the number of people who work in them.

Box 1

Table 1
Clasification of MiPyMes

Classification	Micro	Small	Median	Big
People	1a10	11 to 50	50 to 250	More than 250

Source INEGI (2019)

Micro, small, and medium-sized enterprises (MiPyMes) are fundamental to the business fabric in Latin America, as evidenced by the percentage of companies they represent. Currently, in Mexico, they account for 99.8% of the total, contributing 52% to the Gross Domestic Product (GDP), and globally they represent 94%. They employ 68% of the working population (Secretariat of Economy, 2024).

With respect to global imports, they represent 41% and 36% of global exports (Secretariat of Economy, 2024).

While in the United States there are 3.3 million of these companies contributing 44% to GDP and employing 46% of the total workforce in that country, in Canada there are 1.2 million companies in this category, contributing 50% to its domestic product and employing 88% of the people who have one (Secretariat of Economy, 2024).

These data show the powerful force that SMEs represent for countries in the world and particularly for those countries that form the Free Trade Agreement.

Characteristics of MiPyMes in Mexico

It is important to consider some other important elements in the business landscape, such as the gender perspective, since the participation of women is relevant, considering that 76% of micro-enterprises are owned by a woman, 18% in the case of medium-sized enterprises and 5% in the case of micro-enterprises (INEGI, 2019), which identifies women as key drivers of entrepreneurship in the country, without sufficient evidence to support that gender is a significant variable in business management (Carranza, 2025).

In terms of finance, only 34.40% of business owners use banks, and 25.80% identify savings and loan associations as a source of financing, as explained by INEGI (2019). Even though efforts have been made to stimulate credit demand (Escalera et al., 2025), this suggests other, unclear sources of financial leverage. This indicates that these businesses, at least in Mexico, do not use credit for growth; perhaps this is not the perspective of business owners. Another relevant aspect is the use of financing. According to the Secretariat of Economy (2024), 47.9% of financed businesses acquire supplies, and 58.9% use it for equipment or business expansion. This aligns with the fact that only a very small percentage of businesses view financing as a growth strategy.

On the other hand, decision-making in MiPyMes falls to family members of the owners in the following percentages: for the case of micro-enterprises 15%, for small enterprises 7.4% and medium-sized enterprises 3.1% (INEGI, 2021), which can be identified as an area of opportunity in the strategic part of the company.

Context of León, Guanajuato

In Guanajuato there are 242,534 economic units (INEGI, 2019), placing the state in fifth place nationally, with more companies, with significant representation in the country's economic activities.

As a side note, it is important to point out that Mexico has a thousand companies categorized as larger, by federal entity, where Guanajuato occupies the fifth position with 56 companies of this type, after Jalisco (INEGI, 2019).

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In the city of León, the leather and footwear sector remains the main source of business, followed by vehicle parts and accessories (Secretariat of Economy, 2024). It is important to mention that the Mexican Institute for Competitiveness (IMCO, 2025), categorizes León in position 13 in the urban competitiveness index, which makes it necessary to pay attention to these indices, seeking to maintain the positions achieved that favor the economy of the State. Other important factors include internet access, since according to the Data Mexico portal only 59.7% of households have this service, 44% have a computer and 92% of Leon residents have a cell phone (Secretariat of Economy, 2020).

The Guanajuato State Education Secretariat (SEG, 2024) indicates that, in terms of education, among the population of León aged 15 and over, 4.6% have no schooling, 6.5% have incomplete primary education, 14.1% have completed primary education, 3.4% have incomplete secondary education, 27.8% have completed secondary education, and 20% have completed high school. The State Economy Secretariat (2020) indicates that only 13.4% hold a bachelor's degree and 1.15% a master's degree. Furthermore, changes in the labor market and legal reforms represent an additional challenge for MiPyMes, especially due to the shortage of specialized talent (Hernández, 2024).

These data are merely a general description of the economic, educational, and social conditions faced by MiPyMes in the country and specifically in the city of León. Therefore, they are obligated to strengthen the indicators that help them be competitive and seek to incorporate qualified personnel into their companies, facilitating the adoption of technologies. and work on its own internal management, giving equal priority to all areas that comprise it, as well as recognizing women in the development of the region.

Based on this data, the following hypothesis arises: MiPyMes do not give equal importance to the different areas that make them up internally, which consequently affects their development.

So the question is: How do MiPyMes in the city of León, Guanajuato, prioritize or address internally the areas that comprise them according to the dimensions established in the Intellectus Model?

Literature review

Intellectus Model and its dimensions

The Intellectus Model for measuring and managing intellectual capital was created in 2003 and is called Intellectus Document No. 5. Although its main precursor was the Intelect Model of the Euroforum Escorial University Institute, established in 1998, the Intellectus Model can be considered adapted to the current business environment, according to the findings. by Bueno, Salmador and Merino (2008), among others.

Over time, the Intellectus Model has been analyzed in terms of its structure, operation, and applications. This study resulted in an updated Intellectus Model, taking into account the dynamism and consideration of elements such as entrepreneurship and innovation processes, as well as the Research and Development (R&D) function, without altering its essence, but rather its structure, both in terms of changes and additions.

Systemic, Open, Flexible, Adaptive, and Dynamic operating characteristics. The Model is divided into four dimensions as described below. Bueno et al. (2011).

Human Capital

According to Bueno, (2011) the elements of human capital refer to the knowledge (explicit or tacit and individual or social) that people and groups possess, as well as their ability to generate it, the ability to learn and to share said knowledge with others so that once codified they can benefit the organization.

They are directly related to how people feel at work, the knowledge they possess, and the application of that knowledge in their daily work.

Structural Capital (organizational and technological)

These are intangible assets resulting from procedures carried out with the knowledge of human capital, and which remain the property of the company once that human capital leaves. They are divided into the following types of capital:

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Organizational capital

It refers to intangibles of an explicit and implicit nature, both formal and informal, such as the organization's culture, its structure, its learning methods, and the processes it employs.

Technological capital

It comprises the set of intangibles linked to the technical system responsible for obtaining goods and services, with efficient production processes and technology, plus the effort that the company makes in the research and development of new technologies, to develop future innovations in products and processes

Relational Capital (Business and Social)

This refers to the body of knowledge acquired through the company's interaction with external agents in the surrounding society. Its components are:

Business Relational Capital

The elements of business capital focus on the relationships one has with customers, suppliers, shareholders, competitors, employees, and external institutions.

Social Relational Capital

It is associated with the image that the organization presents to the outside world, that is, the reputation it has, the corporate image, public and social relations, etc.

Entrepreneurship and Innovation Capital

This capital encompasses the company's efforts in improvements or new products whose benefits are seen in costs, quality, time, and performance, as well as innovations that have a technological and social impact. It also adds the valuable component of Being + Being Present, meaning it considers people's willingness to generate the innovations mentioned and constitutes an update of the model itself. The model is presented below, describing the dimensions of capital, its elements, and variables.

Box 2

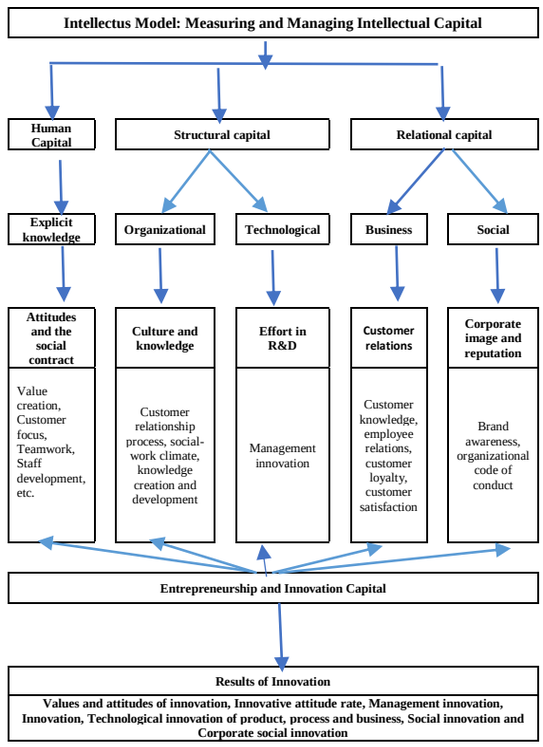

Figure 1

Intellectus Model

Source Bueno et al. (2011)

2.2 Megatrends

On the other hand, megatrends and macrotrends represent a categorization of large-scale, long-term changes that impact society and the economy. These key concepts allow us to understand the major changes that are profoundly and lastingly shaping the future of our societies, categorizing them under five approaches according to their relevance, urgency, and potential impact (Government Municipal of León, 2021).

Box 3

Table 2

Mega trends

Approach	Impact
Human	Health
	Education
	Values
	Communication
Technology	Science
	Automation
Business	Economy
	Finance
	Science
	Job
Environment	Climate change
	Resources
	Urbanization
World	Governance
	Global economy
	Systems

Source Government Muinicipal of León (2021)

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Considering that the Intellectus Model is a structured measurement and management tool, with clear indicators for each dimension and adaptable to each organization, and that it is powerfully influenced by macro and micro trends in Innovation and Development Capital, and given that trends are dynamic, contextual, and adaptable to immediate technological, social, and economic changes, then the need to address all areas that make up MiPyMes with equal importance can be established, as they are affected by these changes, and to accept that trends in the present context and their projection over time influence them as explained in the following figure.

Box 4

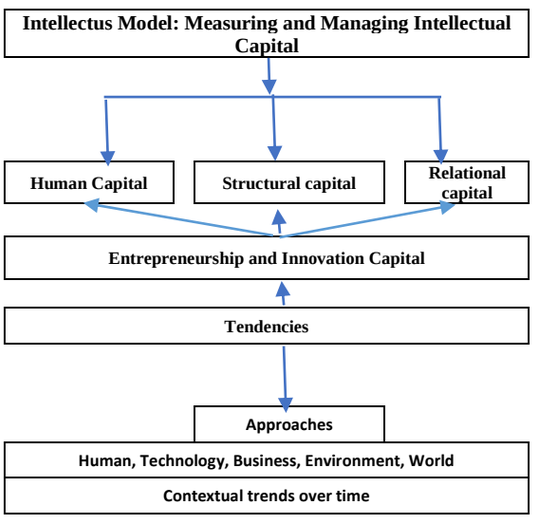

Figure 2

Intellectus Model and Evaluation Approches

Source Own elaboration

The integration of both approaches allows León's MiPyMes not only to adapt to the present, but also to measure and strengthen their intangible assets for the future.

Methodology

This work was approached from the inductive method, connections were made between the objects of study and the causal relationships, supported by observation and the direct application of surveys aimed at measuring the realities experienced in companies, using quantitative measurements through Likert scales, with a descriptive approach grouping and weighting data by cluster, subsequently with inferential statistics.

Different techniques were used that facilitated data processing, thus achieving the research objective. The analysis allowed the data collection to be adapted to the Intellectus Model, identifying the organization in current and global perspectives, namely: 1 Human Capital, 2 Structural Capital (Organizational and Technological), 3 Relational Capital (Business and Social) and 4 Entrepreneurial and Innovation Capital.

The survey is divided into two parts: the first with company identification data and the second subdivided into the 4 types of capital with their respective subcategories, resulting in 6 response categories.

The items are formulated as positive statements with a 3-dimensional Likert scale: Strongly agree, agree, and disagree.

The analysis was conducted using simple random sampling (SRS) with 69 companies and a 90% confidence level. The data collection strategy focused on identifying companies that currently have students completing professional internships. Companies located in various neighborhoods of León, Guanajuato, were also visited, providing a broad overview of the city. The companies have a physical address, which is registered and cataloged in the database derived from this study. Fieldwork was carried out from September to November 2024.

The confidentiality of the information provided by the companies that enabled the collection of empirical evidence has been respected. The companies included operate in the Manufacturing and Services sectors.

Results

Two stages of analysis were carried out. The first consisted of a statistical description by simple grouping by dimension, establishing first a range based on the total score, that is, if the number of statements is 7, it is multiplied by 3 maximum points (Totally agree), then the total points reached will be 21 and it was weighted according to the positive statements presented, resulting in 0 to 7 points for the option in “Disagree”, that is, the statement is not fulfilled and from 8 to 14 points “Agree” considering that the participants do observe this element in their organizations and finally the interval of 15 to 21 points for the category “Totally agree” evidenced that the statement is observable.

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The second step consisted of a non-parametric statistical analysis using a Chi square test of independence (X^2), under the following hypotheses:

H_0: There is no relationship between performance indicators and internal attention

H_1: Is there a relationship between performance indicators and their internal attention?

A 90% confidence level and a 10% significance level were used for the test.

$$x^2 = \frac{\sum(f_o - f_e)^2}{f\text{e}} \quad (1)$$

The decision rule was constructed using a Chi-square distribution table, with (r-1) degrees of freedom in the numerator by (c-1) degrees of freedom, that is, 4 rows by 3 columns = 12 degrees of freedom, which establishes a critical value (X^2) from the table of 19.812

The following table presents the data obtained by grouping.

Box 5

Table 3

Contingency Table

Capital	Totally agree	OK	Disagreement	Total
Human	31	26	11	68
Structural	31	18	20	69
Empren e Inno	8	22	37	67
Relational	24	23	22	69
Total	94	89	90	273

Source Own elaboration

Subsequently, the row-column relationship or matrix transposes were established to obtain the derived value of the statistic.

HTA stands for Human Capital Totally Agree, HA stands for Human Capital Agree, and Human Capital Disagree. Therefore, each of the initials of the capitals is taken, and the 3 possible responses from the instrument are taken.

Box 6

Table 4

Transposed Table

Transposed	Fo	Faith	Fo-Fe	(Fo-Fe)2	(Fo-Fe)2/Fe
HTA	31	23.41392	7.58608	57.5486	2.45788
HA	26	22.1685	3.83150	14.6804	0.66222
HD	11	22.41758	-11.41758	130.361	5.81513
ETA	31	23.75824	7.24176	52.4431	2.20736
EA	18	22.49451	-4.49451	20.2006	0.89802
ED	20	22.74725	-2.74725	7.5474	0.33179
EITA	8	23.0696	-15.06960	227,093	9.84381
EIA	22	21.84249	0.15751	0.02481	0.00114
EID	37	22.08791	14.91209	222.37	10.06751
RTA	24	23.75824	0.24176	0.05845	0.00246
RA	23	22.49451	0.50549	0.25552	0.01136
RD	22	22.74725	-0.74725	0.55839	0.02455
					32.32324

Source Own Elaboration

Table 3 shows in the column called observed frequency minus expected frequency (Fo-Fe) the correlation between the four types of capital with the responses of the instrument (relating row column), the results obtained show positive and negative values in the different rows which reveals on the one hand that there is a correlation between the categories and the data and on the other hand the sign that in some cases is positive and in others negative, indicating that there is a difference in the development or attention of the capitals aligned with the Model; the rest of the table uses the least squares technique to comply with the test statistic.

The null hypothesis is rejected if the value obtained using the test statistic is greater than the critical value obtained from the table ($X^2 > X^2$ u), so 32.3232388 is greater than 19.812.

With these results, it can be concluded that H0 is rejected; the evidence indicates that there is a significant difference in the way the areas of the company considered in the suitability and evaluation carried out according to the four dimensions of the Intellectus Model are managed, and the reason why companies are managed with difficulty.

Testing the assumption that MiPyMes do not give equal importance to the different areas that make them up internally, which consequently affects their development.

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Conclusions

When evaluating business performance based on the categories of the Intellectus Model aligned with megatrends and the levels of attention by categories, it is shown that there is a significant correlation between the performance indicators and the weak management that the MiPyMes of León Guanajuato make of their areas or types of capital according to the Model, this unequal attention reflects fragmented business priorities.

Through statistical analysis and the Chi square test, it is confirmed that companies do not address the different areas that constitute them in a homogeneous way; the differences are observed as follows:

It is identified that Human Capital (HD) is only partially addressed in relation to statements oriented towards worker safety.

In the case of Structural Capital (EA, ED), the values in the table refer to the scarce documented information and planning. limited and lack of technology in the processes.

In the case of Relational Capital (RC), whose These statements relate to the knowledge and monitoring of the value chain, which has also been partially addressed.

Innovation and Entrepreneurship Capital (EITA), which focuses on the existence of areas or departments that promote and develop innovation, which may be incipient since the organizational structures are shown to be poorly documented as observed in this same study, which then limits their ability to adapt to current technological and organizational trends.

This situation is exacerbated by low levels of education, limited access to technology, and a disconnect between the business sector and academia, which are necessary for building solid foundations for companies, for the benefit of both the companies themselves and the professionals in training.

This can be achieved through the development of alliances seeking not only to improve efficiency and productivity, but also to foster a more sustainable, collaborative, inclusive and socially responsible work environment.

For this purpose, digital strategic alliances become relevant for MiPyMes, as they promote engagement and interaction in technological environments (Garcia, 2023). This evidence clarifies that in the city of León there are specific trends that must be addressed urgently, including:

The adoption of artificial intelligence, personalized digital marketing, process digitization, and other essential tools for the growth of MiPyMes, with digital solutions as a key driver of strategic transformation (Pérez, 2023), requires the incorporation of hybrid work, sustainability, nearshoring, and the transition to a Net Zero Economy, promoting healthy environments, as well as the implementation of organizational structures and processes (Polo, 2023). However, for these trends to materialize into real benefits, a profound transformation in organizational culture is needed, along with greater investment in technical and professional training, and public policies that facilitate formalization and access to emerging technologies.

A level of technical and professional training is required to facilitate and promote innovation. Corporate governance training is essential for companies to incorporate it at a certain stage of their development to guarantee their growth and permanence as part of their business vision. This will facilitate strategic decisions. Equally important will be possessing "creative" soft skills (Acosta, 2023) such as: flexible minds, neuroplasticity in the face of extreme specialization, adaptability to rapid and agile change, proactivity, courage and forbearance towards mistakes without dwelling on them, critical yet non-aggressed spirits, a culture of connections, networks, and evolutionary hybridity, understanding that there are generational changes and customs and traditions must become more flexible to survive, as the only certainty is uncertainty.

Therefore, emphasis should be placed on strengthening the business performance of MiPyMes in León, as their ability to to comprehensively manage your Intellectual Capital, giving equal importance to your Capital Human Capital Structural, Relational Capital and Entrepreneurship and Innovation Capital, thus promoting the improvement of the indicators that make them strong, sustainable and permanent.

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Statements

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Author's contribution

Ordaz-Picón, Carla conceived the idea for the article, participated in the sampling, theoretical framework, statistical analysis technique and contributions to the conclusions.

Díaz-González, Claudia contributed the project idea, research technique, sampling and interviews, as well as contributions to the conclusions.

Alatorre-Herrera, Raquel collaborated with the sample, the methodology and made contributions to the theoretical framework and the conclusions.

Martínez-Aguilar, Libia participated in the sampling and made contributions to the theoretical framework.

Availability of data and materials

The data obtained was used to build a database. The processing includes graphs and can be consulted through the following link https://docs.google.com/spreadsheets/d/1glD35zzz2qoS5z088Nbm7w1Ju7dyTiCX/edit?gid=1776619371#gid=1776619371, after prior communication with the authors.

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Abbreviations

EA	Structural Capital of Agreement
ED	Structural Capital in Disagreement
EIA	Entrepreneurship and Innovation in agreement
EID	Entrepreneurship and Innovation at odds
EITA	Capital, Entrepreneurship, and Innovation fully agree
ETA	Structural Capital fully agree
HA	Human Capital Agreement
HD	Human Capital in Disagreement
HTA	Human Capital - Totally Agree
FURTHER	Simple Random Sampling
MiPyMes	Micro, Small and Medium Enterprises
GDP	Gross domestic product
RA	Relational Capital Agreement
RD	Relational Capital in Disagreement
RTA	Relational Capital Totally Agree
USMCA	Free trade agreement

References

Background

Hernández, G., (2024), *Labor reforms and talent shortage, the challenges for the HR agenda in 2025*, *El Economista.*

IMCO, (2025), *Urban Competitiveness Index 2025*.

INEGI (2024). *National Statistical Directory of Economic Units (DENUE) 2024*. National Institute of Statistics and Geography.

INEGI, (2021), *National Survey of Business Financing (ENAFIN)*, National Institute of Statistics and Geography.

INEGI (2019), *Economic Censuses 2019: Businesses in the United Mexican States,* National Institute of Statistics and Geography.

Secretariat of Economy (2024), *Mexican MiPyMes: Engine of our Economy.*

ISSN-On line: 2414-4827
RENIECYT-SECIHTI: 1702902

Ordaz-Picón, Carla, Díaz-González, Claudia, Alatorre-Herrera, Raquel and Martínez-Aguilar, Libia. [2025]. Correlation of the performance indicators of MiPyMes in the city of León Guanajuato and their internal attention. ECORFAN Journal-Republic of Paraguay. 11[19] 1-9: e11119109
https://doi.org/10.35429.EJROP.2025.11.19.1.1.9

Secretariat of Economy (2020), *Data Mexico: Economic Overview of León*. secretariat of Economy.

Guanajuato State Education Secretariat (SEG), (2024), *Sociodemographic Indicators, Educational Statistics of the Municipality of León.*

Basic Concepts

Bueno, E., Del Real, H., Fernández, P., Longo, M., Merino, C., Murcia, C., and Salmador , P. (2011), *Intellectus Model for measuring, managing and reporting intellectual capital (new updated version)* . Madrid, Spain: IADE.

Bueno, E., Salmador, and M., C Merino (2008), *Genesis, concept and development of intellectual capital in the knowledge economy: A reflection on the Intellectus Model and its applications*.

Municipal Government of León. (2021). Municipal Development Plan: León Towards the Future. Vision 2045 (Abridged Version). Municipal Government of León.

Support

Acosta, D. (2023), *The impact of artificial intelligence on creative professions* , Spanish Association of the Digital Economy.

Escalera, M., Hernández, J., López, D., Vázquez, S., & Serrano, C. (2025), *Regional Sectoral Situation Mexico* (25S2), BBVA Research.

Differences

Carranza Lara, A. (2025), *Entrepreneurial orientation in the innovation of MiPyMes in Aguascalientes, a comparative study by gender*.

Discussions

García, F., (2023), *Strategic alliances to boost digital engagement*, Spanish Association of the Digital Economy.

Pérez, A. (2023), *Digital solutions to boost the business of MiPyMes and the self-employed*, Spanish Association of the Digital Economy.

Polo, F. (2023), *A digital strategy to grow in 2024: lessons learned from large companies for MiPyMes,* Spanish Association of the Digital Economy.

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Article

Analysis of the Dynamics of Public Policies Aimed at Promoting MSMEs from the Perspective of the OECD Development Index in the Municipality of León, Guanajuato

Análisis de la dinámica de las políticas públicas orientadas al impulso de las SME's desde la perspectiva del Índice de Desarrollo de la OCDE en el municipio de León, Guanajuato, México

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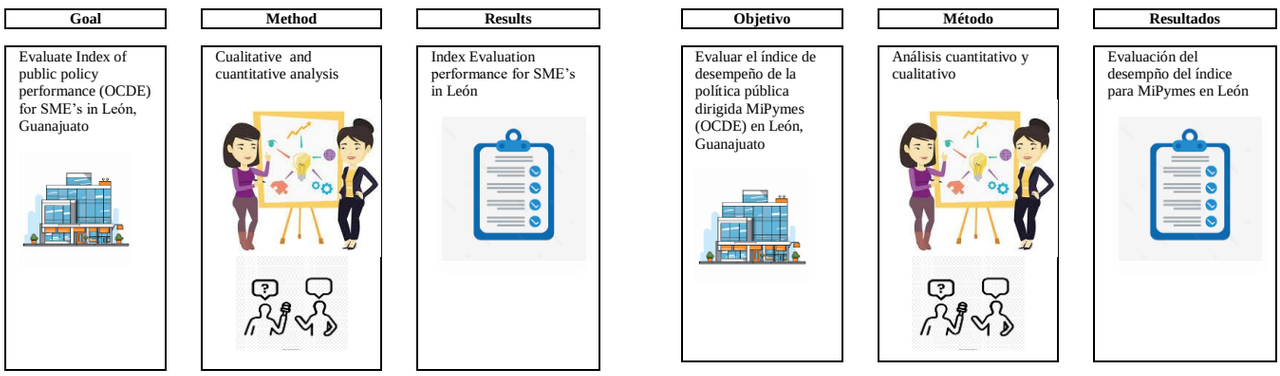
Abstract

The objective of this research is to analyze the current policy environment and its potential influence on decision-making processes concerning business practices among SMEs in León, Guanajuato. The analysis is framed around the eight dimensions of the OECD's SME Development Index (2024), through which key elements can be identified to assess the factors contributing to the creation of favorable conditions for business development in the municipality. This study employs a descriptive-documentary methodology, which involved reviewing and selecting relevant plans, programs, and policy instruments from ten public institutions and organizations engaged in local economic development. A qualitative classification of priorities is proposed to support informed decision-making, with particular emphasis on indicators related to innovation, talent integration and retention, and supply chain linkage.The analysis concludes that current public policy efforts aimed at promoting SME's activity in León are primarily concentrated in the areas of microcredit, digitalization support, and a strong emphasis on the gender dimension. In particular, there is a focused effort to strengthen women's entrepreneurship initiatives, in recognition of the significant increase in recent years in the number of households headed by women.

Resumen

El propósito de esta investigación es analizar el contexto de las políticas públicas del entorno actual que pueden condicionar la toma de decisiones sobre las prácticas empresariales de las MiPymes's en León, Guanajuato considerando las 8 dimensiones del *Índice de Desarrollo de SME's* de la OCDE (2024) El tipo de investigación es descriptivo-documental bajo un enfoque cualitativo para lo cual se realizó una revisión y selección de planes, programas e instrumentos disponibles en 10 de las Instituciones y organismos públicos relacionados con el desarrollo económico local, así como documentos oficiales de la Secretaría de Economía, organismos estatales, organismos municipal. También se realizaron entrevistas con algunos funcionarios del Distrito de Innovación coordinado por Idea GTO y a partir de ello se establecieron las conclusiones sobre algunas tendencias de las políticas públicas que pueden considerarse como prioritarias para su atención y seguimiento a nivel local. Se concluye que existen brechas importantes que provocan una falta de coordinación entre las políticas orientadas a las MiPymes's y aquellas que se encuentran fuertemente vinculadas a la industria 4.0 en la región.



Area: Advocacy and attention to national problems

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Introduction

This paper presents some relevant background related to the findings of preliminary studies carried out in the years 2019 and 20020 on trends in the indicators of intellectual capital and knowledge management models for the municipalities of León, San Francisco del Rincón and Silao that reported the low propensity for change to innovation and staff integration practices in decision-making (Diaz, C. and Ordaz, C 2020).

By 2024, it was decided to resume the analysis of trends considering the impact of the COVID 19 pandemic as an element that accelerated the change in the perspective of local entrepreneurs on their adaptive capacities to deal with such contingencies. The importance of human development, digitization and sustainability variable, with a strong emphasis on the need for more inclusive models for diversity and social responsibility ai med at the environment and gender equity, is remarkable.

The central question that triggered this analysis is based on the need to maintain continuous monitoring of the importance of public policy in the relationship between government and company at local level. So, we analyze what are the priorities of public policy in terms of supporting and promoting business development in the municipality of León, Guanajuato taking as reference the Index of SME's for AL proposed by the OECD in 2024.

In view of the background to the performance of the indicators of the knowledge economy in the sample of companies in the municipalities of León, Silao and San Francisco del Rincón in 2019 and 2020, a new analysis was proposed from the dimensions of business development proposed at the international level and that represents an integral and flexible perspective on the different aspects to be considered in the evaluation of business development from a municipal level.

The model proposed by OECD (2024) to asses performance of the SME's in Latin America represents a key starting point for identifying areas of opportunity to improve the design of public policies and business practices that strengthen economic performance at the local and regional levels in the post-COVID era.

In the case of León, Guanajuato is notable that it is considered the most important economic engine of the State by being part of the industrial corridor of Bajío for its strength in the manufacturing and services sector at the national level and being part of an important ecosystem of innovation in Mexico. In spite of the political and social conditions that have affected the entity in recent years, corporate management has made significant progress in boosting micro and small enterprises that raise employment, as well as intensive training programs staff at technical and operational level mainly.

The need to reverse the economic impact of COVID and to achieve a faster recovery in recent years has been accompanied by the emphasis in new development goals at the national and international levels. In this sense, the objectives of the 2030 Agenda are set out the need "*forjar un futuro más justo, igualitario y sostenible para todas las personas y cumplir con la promesa de no dejar a nadie atrás, no dejar a nadie afuera"* (https: economia.gob.mx / secna2030).

Under this premise, the objectives of the mission and vision of public policies have been established that impact on the business development of the town over the past 5 years, in particular those associated with the drive to the economy, innovation and the consolidation of the supply chains under a social responsibility and sustainability approach as reflected in the main axes of the State Development Plan to 2040.

Economic and social dynamics make it essential to maintain constant monitoring of trends in business development as a central factor in economic growth through employment, investment and the continuous improvement of their processes at different levels of management. In this sense, the academic body "Management and Organizational Innovation" aims to analyze trends at the macro and micro level of management models and the changes and permanencies of the main business practices that exist at the local level as part of the dynamics of economic and social development.

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In the end, it is concluded that there is evidence in the information collected from different source s about a great influence that the political dimension has since the government's action on the drive of business activity considering the size and dynamics of the development of the SME's which most lack management tools to take advantage of the opportunities that open up in a hybrid or mixed economy.

Government actions are of great importance in promoting or inhibiting business, by providing better conditions for the regulation of its operations, ensuring the rule of law, generating incentives to innovation and entrepreneurship, among others. Economic policy and programs aimed at business development can make a difference in the dynamism of a locality or region in a country that opens opportunities for continuous improvement.

The development of SME's is a high priority for policy makers, as they not only drive economic growth, but also contribute significantly to job creation, poverty reduction and the fight against inequality. This requires a public policy framework to address various segments of the population through several initiatives (OECD / CAF, 2019 [12]).

Similarly, the perception of citizens towards businesses plays a crucial role, as these entities are crucial for productive transformation and are key sources of investment. Governments in the region should therefore actively implement a number of policies to encourage SME's to boost investment and enhance their capacity to create jobs.

This paper discusses the current dynamics of SMES's support policies from a local (municipal) perspective in Mexico, with reference to the 8 dimensions of the OECD model for Latin America.

As a result, a qualitative assessment is presented of those dimensions that present strength or weakness in support of business development in the municipality of León, Guanajuato.

OECD and the Policy Index for SME's : Latin America and the Caribbean 2024

According to the 2024 edition of *the Policy Index for SMEs: Latin America and the Caribbean Towards an inclusive, resilient and sustainable recovery* it evaluates regional trends and progress in design, implementation and impact of policies affecting micro, small and medium-sized enterprises (SME's) in nine countries (Argentina, Brazil, Chil e, Colombia, Ecuador, Mexico, Paraguay, Peru and Uruguay), and also helps to identify reform priorities for more effective, efficient and cohesive SME's policies, comparing national measures with OECD standards.

The SME's have demonstrated their fundamental role in the social and economic landscape of the region. They make up 99.5% of companies, and almost nine out of ten companies are in the micro-enterprise category. In addition, SME's contribute about 60% of formal productive employment. These attributes, amid complex scenarios, have led to an even greater emphasis on positioning their development as a clear priority for policymakers in Latin America and the Caribbean. In this regard, government actions are relevant as factors that can increase the competitiveness of companies.

The reference document provides an assessment through 8 public policy dimensions and 29 subdimensions, accompanied by descriptions of country-specific challenges and provides a way forward with recommendations at the local or municipal level. For the first time, the evaluation includes an analysis of policies for the digitization of SME's, which is crucial for promoting an inclusive, resilient and sustainable business sector, especially in view of the post-COVID19 pandemic context that forced many companies to connect to the Internet for the first time, first-hand experience the value of digital technologies along with a pilot dimension of green economy and a cross-cutting gender approach.

The dimensions included in the model analysis are shown in Figure 1

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Box 1

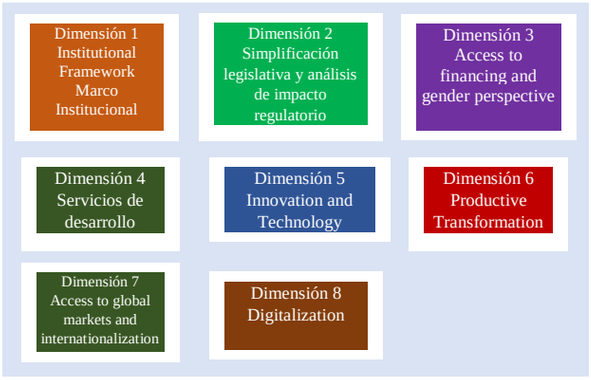

Figure 1
SME's Public Policy Index Dimensions in Latin America
Source: OCDE (2024)

This work has identified some programs at the state and local level in the case of Guanajuato and the municipality of León in particular, it is possible to observe the policies of impulse that can be positively evaluated from the dimension s proposed by the OECD to promote stronger links between the SME's and the large companies, taking advantage of the potential of large companies to act as customers, innovation partners and advisers. The dynamics of the links between national cluster organizations and regional innovation actors, reflecting the importance of space proximity as a strategy for enhancing competitiveness.

In this regard, important regional studies have been identified that highlight the importance of business strengthening strategies in the states of Guanajuato and Jalisco as part of public policy around the collaboration of the different production chains and specific sectors where the main local and regional economic activity is concentrated. (Colin and Carbajal, 2025).

On the other hand, it is important to consider improving efforts to close gender gaps and create the conditions and opportunities for the development and growth of women-led or women-owned SME's. The region has made progress in integrating a gender perspective into policies and programs. However, much remains to be done, and it is essential to improve data collection and analysis from that perspective.

This study used a methodology that identified 8 dimensions of analysis to assess the current situation of SMEs for each country in the region, and which can be moved to the local level as part of a micro analysis.

Planning and Business Development in the municipality of León, Guanajuato

The State of Guanajuato is located in one of the emerging regions that have expressed interest in the promotion and adoption of industry technologies 4.0 with the intention of making its manufacturing industry particularly driven by the automotive sector more competitive. (Martínez, et. al., 2022)

On the other hand, the health crisis of COVID led to the need for a shift towards greater digitalization of processes in companies such as telework, virtual meetings, distance training or *reshoring* supply chains.

For its part, the municipality of León as the economically most important city of Guanajuato represents an interesting case study in front of other municipalities of the country considering that its main economic activity has been industrial-manufacturing, which in several cases has been able to be inserted into the production chains of other larger sectors such as the automotive or have managed to take advantage of the foreign market mainly in North America. Despite the political and social conditions that have affected the entity in recent years, corporate management has made significant progress in boosting micro and small enterprises that raise employment, as well as intensive training programs for staff at technical and operational levels.

The need to reverse the economic impact of COVID and to achieve a faster recovery in recent years has been accompanied by the emphasis on new development goals at the national and international levels. In this sense, the objectives of Agenda 2030 are to set out the need "*To forge a fairer, more equal, and sustainable future for all people and to fulfill the promise of leaving no one behind, leaving no one out*". *(http:economía.gob.mx/secna 2030)*

Under this premise, the objectives of the mission and vision of public policies have been established that impact on the business development of the town over the past 5 years, in particular those associated with the drive to the economy, innovation and the consolidation of the supply chains under a social responsibility and sustainability approach as reflect ed in the main axes of the State Development Plan to 2040. (IPLANEG, 2018).

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The municipality of León, Guanajuato is one of the economic engines of the state, with a population on of more than 1.7 million people and a wide range of economic activities. At present, the main area of the town remains the leather and footwear industry, where exports reach up to 31% according to data from the Ministry of the Economy in 2025.

According to data from the National Statistical Directory of Economic Units del INEGI (INEGI, 2022) in the state of Guanajuato there are a total of 269, 3 37 micro and small enterprises of which 255,093 are classified as micro and 14,244 as small enterprises.

In parallel to indicators at the international level, at the local or municipal level, data on the informal economy account for economic conditions and require coordinated public action.

For the municipality of León, the National Survey of Occupation and Employment (ENOE) of INEGI for the first quarter of 2025, the rate of labour informalit y in the state of Guanajuato was 54.7%. This means that they are not incorporated into companies and therefore lack social security protection, bene fits or a formal contract.

Although the document "Study of the context of the economy and informal employability in the municipality of León, Guanajuato 2020-2022" does not set an exact figure, it is possible to assume that the informality indicator ranges from 55% to 60% to understand the magnitude of the problem.

According to the Network of Latin American Studies in Administration and Business (NLASAB) in its study for the case of the sample of micro and small companies in León, he noted that the competitive advantages of micro and small entrprises require to optimize the process in human resources, good management of finance in the company and to pay attention to the role played by management (Paredes, et.al, 2024).

Economic and social dynamics therefore make it essential to maintain constant monitoring of trends in business development as a central factor in economic growth through employment, investment and the continuous improvement of their processes at different levels of management.

Methodology to develop

The approach of this research is of a qualitative and transsectional documentary nature. With reference to the 8 dimensions of the OECD analysis model (2024), a search was initiated for the main programs and projects at the state and municipal level of the State of Guanajuato and, particularly of León that have had more projection and support in order to identify priorities in public policy aimed at promoting SME's. In addition, some access barriers to programs development were identified as part of the initial diagnosis.

The exploratory study included the review of 10 official websites of agencies related to the support of the SME's, the review of published articles related to the diagnosis of programs and projects of impulse from 2024 to date, and an in-depth interview with an official of the State Office of Innovation Promotion of the Government of the State of Guanajuato (IDEA GTO).

This research made an indirect observation of the actions of the main bodies related to the formulation or implementation of policies aligned to the 8 dimensions of the model. The organizations were grouped according to their level of incidence in the subdimensions, among which they were located in Secretariat of Economy and Sustainable Developmente, COFOCE, CIATEC, IMPLAN, IPLANEG, INMUJERES, AMEXME, CANACINTRA LEON, IDEA GTO mainly.

Once the programs and projects were identified, the public policy index for the case of León was established based on the scale of 1 to 5 in or der of maturity or implementation proposed by the OECD model, obtaining the following data as shown below in Table 1.

Box 2

Table 1

Comparative table of the Public Policy Performance Index for SMEs (AL, Mexico, León)

Model Dimensions	Índex LATAM	Índex México	Índex León
Dimensión 1. Institutional and Legislative Framework	3.875	4.22	4.05
Dimension 2. Operative Environment and Administrative Simplification	3.205	3.867	3.95

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Dimensión 3. Access to financing	3.24	4.12	4.26
Dimensión 4 Bussiness Development Services	4.2	4.18	4.16
Dimensión 5 Innovation and Technology	3.97	4.14	4.4
Dimensión 6. Productive Transformation	3.96	4.23	4.19
Dimensión 7 Access to global markets and globalization	4.32	4.35	4.35
Dimensión 8. Digitalization	4.15	4.28	4.07

Source: Author's own elaboration

Results

As a result of the review of the selected information, the following was observed based on the 8 dimensions for the context of the programs and projects in force for the promotion of the SME's in the municipality of León, Guanajuato.

As a result of the review of the selected information, the following was observed based on the 8 dimensions for the context of the programs and projects in force for the promotion of the SME's es in the municipality of León, Guanajuato.

Regarding dimension 1 of the Institutional and legislative framework, it was noted that it is fragmented as the laws governing support for the SME's are dispersed in different programs and projects that cause the spraying of resources. Like the indicators at international level, the municipality de León has a high percentage informal economy.

In dimension 2 on operating environment and administrative simplification it is possible to say that there are support such as credits or certifications, however, it requires multiple procedures to various institutions when it comes to support credits with public funds provided by the Guanajuato Funds program and the Ministry of the Economy. A large number of companies, especially in peripheral areas, do not have legal advice or administrative support which creates barriers to entry.

In dimension 3 on access to financing, the most important initiative is financial "Tu puedes Guanajuato". This program offers nine credit options with competitive interest rates. The amounts range from 10,000 to 3 million pesos.

According to the documentary research carried out, at least 8 programmes derived from public funds are identified with maximum amounts of 3 million pesos, which can be said that the size of the economy is below the national average at the municipal level. Other programs at the municipal level are" *Suma tu Negocio* "which funds furniture, equipment and / or tools to strengthen y our business units. There is also support for rural entrepreneurs through the Directorate General for Rural Development with specific support to support rural community entrepreneurs with equipment and marketing spaces. Despite the presence of these programs, the requirements may be complex especially for companies with no credit history, and no experience in processing documentation to ensure a return rate for the creditor.

In this dimension, emphasis should be placed on the cross-cutting gender approach, as it has been given a special emphasis at the municipal level on microcredit access to women entrepreneurs, which reflects a commitment to the principle of gender equity in policies of access to finance. Thus, specific programs of institutions such as AMEXME León, INMUJERES León were identified.

According to INEGI data, it is estimated that one in three companies (approximately 33%) in the state is led by a woman. The Secretariat for Sustainable Economic Development (SDES) in Guanajuato has reported similar figures, indicating that about 34% of micro, small and medium-sized enterprises in the entity are in the hands of women.

If we believe that, according to the Population and Housing Census 2020 conducted by INEGI, 3 1.5% of households have a woman as head of th e family, the growth potential of the SME's is raised in this sector as we are talking in the same case of one third of SME's headed by women and in many cases also heads of the family (INEGI, 2020).

In August 2025 the municipal government of León announced a series of programs and support amounts for women-led companies. An investment of more than 72 million pesos was confirmed in strategic programs focusedexclusively on the development and inclusion of women by 202 5 distributed in some programs such as:

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Suma Tu Negocio (enterprises); *Unidas Avanzamos* in collaboration with the Bank Affirms with 1,318 credits granted and others such as *En Marcha* that provides equipment for business and "*Ellas en los Negocios*" focused on leadership training and business strategies.

In dimension 4 on business development services, there are multiple agencies that provide training, legal advice and business linkages. There are bodies such as the CIATEC (http:// ciatec.mx) that are aimed at innovation, industrial property and technology management. The COFOCE, which specializes in support of internationalization and e-commerce (http:// cofoce.org.mx) and CANACINTRA AND CONCAMIN, which support formalization and certification processes. There are also programmes from IDEA Gto that seek to boost the innovation of the SME's by linking with research groups of universities and research centres and have physical spaces and laboratories for collaboration.

According to Gabriel Santos Navarro, Director General of Scientific and Technological Development of the Institute of Innovation, Science and Entrepreneurship for the Competitiveness for the State of Guanajuato (IDEA GTO), the policy of promoting innovation re volves around the creation of the Innovation District and the initiative of the Mentefactura Valley within the State's Inner Port (personal communication, 20 January 2025).

In that space are located important national and international companies and other bodies that facilitate communication between academia, government and company. This facilitates the link and development of specific actions such as meetings, workshops, training that function as a link between companies and research groups.

However, the approved projects focus mainly on companies linked to strategic sectors with a medium or high level of knowledge in the field of in novation and technology, especially in view of the drive for industry 4.0 so that access for SME's companies is very limited despite the existence of programs such as entrepreneurship funds, the Manufacturer program and the creation of a Global Network of Mentors for business advice.

In dimension 5 on Innovation and Technology, the municipality of León is part of an ecosystem with a high concentration of technological capabilities. The state of Guanajuato has been consolidated with an innovation ecosystem with 8 technology parks and 10 business clusters that promote collaboration, competitiveness and the development of new technologies in strategic sectors such as agro-industry, automotive, fashion, ICT's and recently aerospace. This ecosystem has been known as the "Mentefactura Valley" which seeks to move from manufacturing to an economic model based on knowledge and innovation led by I IDEA GTO.

According to the Dr. Gabriel Santos, the government of the State of Guanajuato has sought to promote an innovation policy based on strategic alliances whose focus is on the priority themes of the development agenda such as agriculture, the automotive industry, information technologies and to some extent an open science and gender perspective, although the latter limited in many respects. (personal communication, 20 january 2025).

In dimension 6 of productive transformation, an active process of modernization is detected in traditional sectors, especially in footwear, leather, fashion and textiles where clusters have promoted automation, export and certification. The presence of specialized industrial parts such as PILBA or Colinas de León has encouraged the attraction of investments and companies that adopt clean technologies.

In dimension 7 on market access and internationalization, the programs of the Coordination fo r the Promotion of Foreign Trade (COFOCE) that have been accompanied by the imposed on the adoption of new export technologies through pro grammes such as *Ecommerce Go Export* and the creation of digital villages for traditional sector s through e-commerce and which seeks to support particularly small and medium-sized enterprises in the manufacturing sector.

The dimension 8 on digitalization has been developed digital platforms for job and business links and support for the development of e- commerce, virtual shops and digital marketing.

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In figure 1 it is possible to see that for the case of the municipality of León, the performance rate of public policy is very close to the average of th e index in respect of Latin America and the national in Mexico, which shows that in public policy there are initiatives to boost the economy of the SME's. However, the high rate of informality and the heterogeneity of the business structures in terms of the size, organizational development and training of human capital does not have the expected impact for proper monitoring.

Box 3

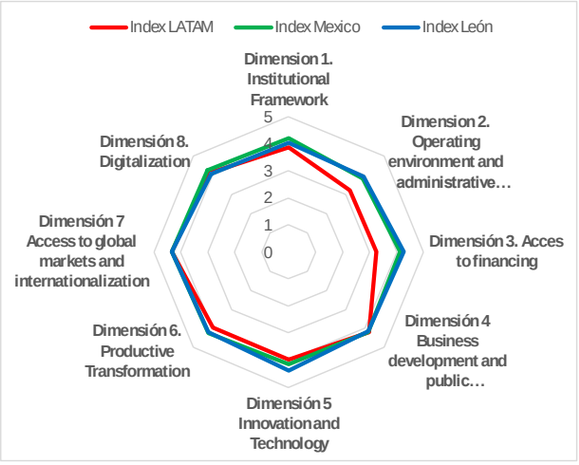

Figure 1

Public policy performance index for MiPymes by di mension (AL, Mexico, León)

Source: Authors Own Elaboration

Conclusions and recommendations

Taking into account the 8 dimensions of the OECD public policy analysis to assess the development of the SME's and using the information analyzed between 2024 and 2025 in the sources of information consulted, we can conclude the following:

– There is a public policy to promote SME's which is administered through State public bodies, but there is little coordination to assess the im pact of programs on performance indicators.
– Important programs of access to finance are recognized by providing credit to small entrepreneurs. It also recognizes important training and advisory programs for micro-entrepreneurs through government agencies and units, however, no official figures were found where it is possible to verify the number of companies or persons benefiting.
– Highlights the momentum and support for wo men entrepreneurs, recognizing the importance of the gender approach in the municipal and state policy aimed at women & entrepreneurship development in line with the gender mainstreaming that is included in the OECD study.

The government of the state of Guanajuato, which has benefited the municipality of León for its a ctivities in the manufacturing and commercial se rvices sector, as well as its proximity to the tech nological parks and industrial clusters, has made it an important aspect of innovation. It is therefore possible to highlight this as one of the most valuable dimensions in the analysis, although innovation policy has been largely used by large companies associated with industry 4.0

Latin America and the national in Mexico, which shows that in public policy there are initiatives to boost the economy of the SME's, however, the high rate of informality and the heterogeneity of the business structures in terms of the size, organizational development and training of hum an capital does not have the expected impact for proper monitoring and monitoring of the results.

Finally, the lack of coordination and monitoring of programs results in an uneven scenario for companies where most do not have the physical and human infrastructure to access the benefits of these programs, so it is necessary to design new management processes between the government and the beneficiaries to maximize the resources available by combining training, access to financial resources and promoting a culture of acc ess to digital media, entrepreneurship and in general towards organizational change.

Statements

The authors state that there is no conflict of inter est. There are no economic interests or personal relationships that may have influenced this article.

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Contribution by author

Claudia Leticia Díaz González: Leader of the academic body "Management and Organizational Innovation," development of the main idea of the research project, proposal of the approach and method of research on the subject, analysis of data and generation of conclusions.

Carla Patricia Ordaz Picón: Collaborator in the generation of the theoretical-conceptual framework based on other models of analysis.

Raquel Alatorre Herrera: Collaborator in the project, participated in the analysis of the dimensions of the model and in the validation of the information.

Fátima Guadalupe Olmos: A 9-semester stud ent from Engineering in Business Management c contributed to the documentary review, classification ion of sources and preparation of the final report.

Availability of data and materials

The data presented in this paper are public and are available in the OECD Latin American Performance Index Report (2024). For the data generated for the specific case of the municipality of León, Guanajuato are available directly with the author or to her e mail as well as the content of the interviews.

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To the teachers and students involved in the development of the project and to the Doctor Gabriel Santos, Director of Scientific and Technological Development of IDEA Gto. by the information provided in the interview.

Abbreviations

AMEXME	Association of Women Entrepreneurs of León
CANACINTRA	National Chamber of the Manufacturing Industry
CIATEC	Center for Innovation in Competitive Technologies
COFOCE	Council for the Promotion of Foreign Trade
CONCAMIN	Confederation of Industrial Chambers of the United Mexican States
IDEA GTO	Institute of Innovation, Science and Entrepreneurship for Competitiveness for the State of Guanajuato
IMPLAN	Municipal Planning Institute
INEGI	National Institute of Statistics and Geography
INMUJERES	National Institute for Women
IPLANEG	Guanajuato State Planning Institute
SME's	Small and Medium Sized Enterprises
OCDE	Organisation for Economic Cooperation and Development
RELAYN	Latin American Network of Management and Business Studies
SDES	Secretariat of Sustainable Economic Development

ISSN-On line: 2414-4827
RENIECYT-SECIHTI: 1702902

References

Background

Díaz, C. y Ordaz C. (2020) "Estudio y análisis del comportamiento de indicadores de la gestión del capital intelectual en SME's de León, Guanajuato bajo el enfoque del Modelo Intellectus", Revista de Desarrollo Económico.

Díaz, C. y Ordaz, C (2019) "Análisis de la dinámica de los indicadores de la economía del conocimiento desde la perspectiva empresarial en el corredor industrial Silao, León, San Francisco del Rincón en Guanajuato, México."

Gobierno del Estado de Guanajuato. [2021] Programa de Gobierno 2018-2024 (actualización 2021). Periódico Oficial del Estado de Guanajuato

IMPLAN, Estudio del contexto de la economía y empleabilidad informal en el municipio de León, Guanajuato para los años 2020-2022.

IPLANEG (2018) Plan Estatal de Desarrollo Guanajuato 2040.

Secretaría de las Mujeres. [2025]. Acuerdo por el que se emiten los Lineamientos del Programa de Atención Integral para el Bienestar de las Mujeres, para el ejercicio fiscal 2025. Diario Oficial de la Federación.

Basics

OECD, CAF, & SELA. 2024 Policy Index for SMEs: Latin America and the Caribbean Towards an inclusive, resilient and sustainable recovery OECD Publishing.

Secretaría de Economía [2025] Agenda 2030,

CIATEC [2025] Oferta académica y programas de capacitación 2025. CIATEC.

COFOCE. [2022] Programa Desarrolla oferta exportadora. Periódico Oficial del Gobierno del Estado de Guanajuato.

COFOCE. [2025, 26 de febrero] Presenta COFOCE plan de capacitación ante el entorno global 2025. Coordinadora de Fomento al Comercio Exterior del Estado de Guanajuato.

Open IA, Prensa León. [22 de noviembre de 2024]. COMERCIOS DE LEÓN SE FORTALECEN CON PROGRAMAS COMO SUMA TU NEGOCIO. Noticias del Municipio de León, Guanajuato.

IPLANEG (2018) State Development Plan Guanajuato 2040.

INEGI (2025) Encuesta Nacional de Ocupación y Empleos (ENOE) del INEGI.

Instituto Nacional de las Mujeres (INMUJERES). (2020). Programa Institucional 2020-2024 del Instituto Nacional de las Mujeres. Diario Oficial de la Federación.

IMPLAN, Estudio del contexto de la economía y empleabilidad informal en el municipio de León, Guanajuato para los años 2020-2022.

Support

Colín - Pérez, S. N. ., & Martín Carbajal, M. de la L. (2025). Fortalecimiento de los sistemas productivos en los talleres de confección textil de Moroleón, Guanajuato. *Diversidad Económica Nicolaita*, (2), 73–94.

Paredes, R. et al. (2024). La ventaja competitiva de la micro y pequeña empresa desde la perspectiva de la teoría de sistemas. McGraw-Hill Interamericana Editores.

Differences

Martínez, A. M., Medina, L. Á., & Garnica, A. G. (Eds.). [2020]. Industria 4.0 en México: Elementos diagnósticos y puesta en práctica en sectores y empresas (pp. 133-152). Universidad Nacional Autónoma de México.

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Article

Analysis of the implementation of POS terminals at the Tecamac food market, state of Mexico

Análisis de la implementación de las TPV en la central de abastos de tecámac, estado de méxico

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Abstract

The objective of this research is to analyze the operational, economic, and social feasibility of implementing Point of Sale Terminals (POS) in businesses established within the Tecamac Supply Center, State of Mexico. A mixed approach was used, collecting quantitative data (direct surveys) and qualitative data (observation and document analysis). It was identified that 65% of tenants already use some POS or digital payments, with non-bank terminals being the most common Clip, Zettle, Mercado Pago, and Billpocket are most popular due to their low entry cost, ease of use, mobility, and lack of formal tax requirements. Bank POS terminals, such as BBVA, Banorte, Banamex, and Intercam, are used less frequently but represent a solution with greater institutional support and security levels. From a cost perspective, it was concluded that non-bank POS terminals are affordable, with prices ranging from $300 to $2,000 MXN, with no fixed monthly fees. Bank-owned POS terminals, which cost more than $4,000 MXN and carry lower monthly rentals and transaction fees. The study demonstrates that implementing POS terminals in the Tecamac Supply Center is technically feasible, economically profitable, and socially relevant.

Created by Marc Torrada
from Noun Project

POS, SMEs, Central

Resumen

Esta investigación tiene como objetivo analizar la viabilidad operativa, económica y social de implementar Terminales Punto de Venta (TPV) en los comercios establecidos dentro de la Central de Abasto de Tecamac, Estado de México. Se utilizó un enfoque mixto, con recolección de datos cuantitativos (encuestas directas) y cualitativos (observación y análisis documental). Se identificó que el 65% de los locatarios ya utilizan algún tipo de TPV o pagos digitales, siendo las terminales no bancarias como Clip, Zettle, Mercado Pago y Billpocket las más populares, debido a su bajo costo de entrada, simplicidad de uso, movilidad y falta de requisitos fiscales formales. Las TPV bancarias, como BBVA, Banorte, Banamex e Intercam, se utilizan menos, pero representan una solución con mayor respaldo institucional y niveles de seguridad. Desde una perspectiva de costos, se concluyó que las TPV no bancarias tienen precios accesibles, que oscilan entre los $300 y $2,000 MXN, sin cargos mensuales fijos, a diferencia de las bancarias, que superan los $4,000 MXN e implican rentas mensuales y comisiones más bajas por transacción. El estudio demuestra que la implementación de TPV en la Central de Abasto de Tecamac es técnicamente factible, financieramente rentable y socialmente pertinente.

Created by Marc Torrada
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TPV, PYMES, Central

Area: Dissemination and universal access to science

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Introduction

The growing demand for electronic payment methods and the emergence of accessible technological solutions, such as Point of Sale (POS) terminals, are opening up new opportunities for developing commerce in different types of businesses. The use of cash represents a conflict for the efficiency, security, and formalization of commercial transactions. This research focuses on analyzing the use of POS terminals at the Tecamac Central Market in the State of Mexico.

The various forms of payment received by merchants at the Tecamac Central Market were analyzed using a mixed approach that combines quantitative and qualitative methods to identify the main advantages, disadvantages, and barriers to the adoption of these payment tools. This analysis seeks to offer recommendations that will allow merchants to take advantage of the benefits of implementing POS terminals to improve their competitiveness and contribute to the economic development of the community.

In terms of the quantitative method, a structured interview was conducted with 116 merchants at the Tecamac Central Market, gathering information on the types of terminals they use, their level of satisfaction, frequency of use, and perception of security as reasons for their choice. With regard to the qualitative method, a documentary technique was used, consisting of the collection, analysis, and systematization of information from secondary sources. These include academic literature, market reports, and analyses by specialists related to the use of POS terminals in Mexico.

1. Feasibility Analysis of Implementing POS Terminals at the Tecamac Central Market

This study focuses on the use of POS terminals at the Tecamac Central Market, located in Santo Domingo Ajoloapan, Tecamac, State of Mexico, which has modern facilities offering a wide variety of products at low prices.

Box 1

Figure 1
Photo of the Tecamac Central Market
Source: (Central de abastos de Tecámac, 2025)

Note: The image is a panoramic photo of the Tecamac Central Market.

The implementation of bank and non-bank POS terminals in the businesses of the Tecamac Central Market is a financially viable and strategically timely initiative. as this market is a place where large volumes of cash circulate daily and there is a constant flow of buyers, creating conditions conducive to the modernization of payment methods. Incorporating technological solutions such as POS terminals contributes to improving operational efficiency, increasing transaction security, and promoting financial development among merchants.

(Cabrera Felipe, 2023), in their analysis of the rapid evolution of payment methods in Latin America published in McKinsey & Company in 2022, point out that the current environment shows a growing consumer preference for digital payment methods, driven by factors such as the use of bank cards, electronic wallets, and social programs that distribute resources through cards or digital accounts.

Addressing this trend in local businesses helps capture a broader customer segment, increase revenue, and professionalize financial management. Additionally, there are POS options on the market with varying levels of complexity and cost, from traditional banking solutions to non-banking tools offered by Fintech, which allow small merchants to operate without the need to be fully banked.

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Access to these tools is subject to certain conditions that must be met to ensure their success, including the need for adequate minimum infrastructure, such as mobile internet or Wi-Fi connectivity, as well as constant access to electricity to charge devices. It is also essential to implement training programs for merchants, as some are unfamiliar with the uses of these technologies. Digital literacy, awareness of the benefits of reducing cash use, and institutional support are key factors in promoting the effective adoption of POS terminals.

It is important to consider that not all businesses require the same type of terminal or face the same barriers, which is why the implementation model must be flexible, allowing the use of traditional POS terminals in more established businesses and simpler options, such as barcodes or mobile devices with readers, in informal or smaller-scale establishments. The participation of government entities, merchant associations, or financial institutions could facilitate this transition through subsidy schemes, soft loans, or equipment data.

From an economic point of view, the costs of acquiring and implementing these terminals vary. Bank POS terminals tend to involve higher initial costs, in some cases monthly rentals, while non-bank POS terminals have a lower fixed cost, with no monthly payments, making them more attractive to merchants with variable or informal incomes. Transaction fees for POS terminals typically range from 1.5% to 2.5%, while Fintech fees can reach 3.6% or 4% plus VAT, although many of the latter offer interest-free months and immediate payment facilities (Elizondo, 2025)

In terms of financial development, the project has significant advantages. The initial investment per merchant can range from $300 to $2,000 MXN in the case of non-bank POS terminals and up to $4,000 in the case of bank POS terminals (Polanco, 2025). The increase in sales and return on investment can be achieved in a very short period, between one and three months, depending on the volume of transactions. Thus, there are financing alternatives or business microcredits that could facilitate the acquisition of equipment by tenants, which reinforces the viability of the project from an economic sustainability perspective.

Electronic payments have been on the rise, especially among young consumers, who tend to use bank cards or mobile payment apps. However, some merchants express fear of being audited by the SAT or losing control of cash flow. It will be essential to develop an awareness and training strategy that explains the benefits of banking, income formalization, and access to credit through a visible financial history. This would not only benefit tenants but also contribute to strengthening the local economy.

The implementation of POS terminals at the Tecamac Central Market is a viable measure with high potential impact, which not only modernizes payment methods and improves the customer experience, but also strengthens financial security, promotes the formalization of the local economy, and facilitates merchants' access to financial services. With the right approach, this strategy can become a key step toward the digital transformation of traditional commerce in the municipality.

The analysis of the feasibility of implementing bank and non-bank POS terminals in the Tecamac Central Market is prudent because it is a point of high economic activity, with significant daily circulation of people and cash, making it a conducive environment for introducing technological solutions that optimize payment processes, strengthen security, and expand financial inclusion.

There is a growing trend among consumers towards the use of digital payment methods, motivated by the expansion of the use of bank cards, electronic wallets, and social programs that distribute resources through cards. This demand represents an opportunity for merchants to increase their income, expand their customer base, and professionalize their management. The market offers various POS options, from traditional banks with greater technological robustness to non-bank options offered by Fintech, which are accessible to small merchants without the need to be fully banked.

In addition to this, there is a proposal to implement training programs for tenants of the Tecamac Central Market, as a large percentage of them are unfamiliar with the use of POS terminals and related technologies.

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It is important to raise awareness among them of the benefits of reducing cash payments and to encourage them to accept training and support in the use of POS terminals wherever they decide to purchase them, so that they can adapt to them successfully.

Implementation will be another element of analysis, as not all businesses require the same type of terminal. Therefore, an adaptation phase is required that considers bank POS terminals in established businesses and simpler solutions, such as QR codes or mobile readers, for informal merchants or micro-enterprises.

Box 2

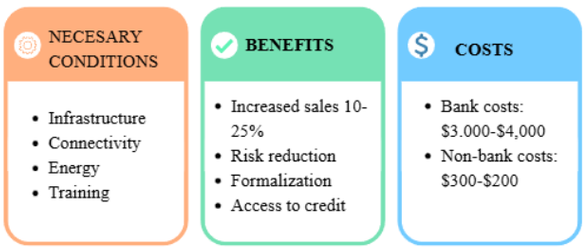

Figure 2
Feasibility analysis of implementing POS terminals
Own Elaboration 2025

Note: The figure shows the elements of analysis in the feasibility of POS terminals in the Tecamac Central Market.

1.1 Identification of the types of banking and non-banking POS terminals most commonly used in markets and commercial areas in the State of Mexico

Bank terminals continue to predominate in formal businesses and established chains, such as supermarkets, pharmacies, and convenience stores. These POS terminals are usually provided directly by financial institutions such as BBVA, Banorte, Citibanamex, or Santander, and integrate complete functions such as EMV chip readers, NFC technology for contactless payments, and connectivity through fixed or wireless networks. Their use is generally linked to a business account with pre-established commissions and formal technical support, making them a robust but less flexible solution with higher barriers to entry for small merchants. The growth of e-commerce, changing consumer habits, and the need to modernize payment methods in the informal sector have significantly driven the adoption of POS terminals in Mexico.

In the context of the State of Mexico, one of the most densely populated and commercially active entities in the country, the use of POS terminals has expanded in both formal and informal sectors, although with clear differences between them.

However, their adoption involves certain requirements such as having a business account, credit history, and tax compliance (RFC and invoicing), in addition to possible monthly fees or variable commissions. For these reasons, their penetration in informal or low-income markets is limited, as the barriers to entry are high for micro-entrepreneurs, tenants without tax registration, or mobile merchants.

POS terminals developed by Fintech companies such as Clip, Mercado Pago, Zettle, Billpocket, Kiwi, and Sr. Pago have revolutionized access to electronic payment methods. These terminals stand out for their low acquisition cost, starting at MXN 299, no monthly fees, fixed transaction fees of 2.9% and 3.5%, (Polanco, 2025), and ease of use. Some models connect via Bluetooth to smartphones, while others are autonomous, with batteries, card readers, and 3G/4G connectivity.

These features have allowed for their widespread adoption in street markets, public markets, and small shops in municipalities such as Ecatepec, Tecamac, Chimalhuacán, and Neza, where infrastructure is limited and mobility is essential. These solutions do not require an RFC or mandatory invoicing, which facilitates their implementation in semi-formalized environments and can represent the first step toward financial inclusion.

Recognizing these two main types of POS terminals reveals a clear pattern of segmentation: banking solutions dominate formal commerce, while Fintech effectively responds to the needs of traditional and popular commerce. Thus, for the Tecamac Central Market, in an environment characterized by a mix of formality and informality, the successful implementation of POS terminals must consider this duality and design differentiated strategies for each merchant profile. POS terminals are a key option for improving operational efficiency, reducing the use of cash, attracting customers with digital payment methods, and encouraging the transition to more structured financial models.

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Correctly identifying these tools will allow the project to establish a solid basis for evaluating its viability, impact, and sustainability.

1.2 Compare the technical operating characteristics, advantages, disadvantages, costs, and benefits of POS terminals available on the domestic market

The Tecamac Central Market has established itself as a fundamental pillar in the economic structure of the municipality and its surrounding area. Its operation has not only transformed the local landscape but has also had positive repercussions on the regional economy. This trade center plays a crucial role in supplying fresh food, guaranteeing the availability of quality products for the region's inhabitants. In its continuous growth, it has fostered the creation of both direct and indirect jobs, contributing to improving the living conditions of many citizens.

In this economic context, the modernization of commerce has significantly boosted the use of POS terminals, which have revolutionized the way commercial transactions are carried out at the Tecamac Central Market. Merchants have begun to recognize the importance of these technologies in optimizing their payment processes, improving transaction security, and ultimately offering a more satisfying shopping experience to consumers.

POS terminals are mainly provided by traditional financial institutions that are characterized by their direct interaction with business bank accounts. This connectivity allows merchants to manage their finances more efficiently by facilitating access to additional services such as loans and financing. On the other hand, POS terminals offered mainly by Fintech and technology companies have gained ground at the Tecamac Central Market.

The survey reveals that 42% of merchants in the area use this type of non-bank POS terminal, highlighting that the reasons are their accessibility and flexibility, which makes them an attractive option for entrepreneurs, street vendors, and small businesses that are not formally banked. These terminals operate through mobile applications or more economical devices, which reduces barriers to entry and allows a greater number of merchants to benefit from their advantages.

In this way, the commissions they apply are usually competitive, which is an additional attraction for small business owners seeking to maximize their profit margins.

In this environment, where both formal and informal businesses coexist, making sound financial decisions is essential to ensure the permanence and growth of businesses. One of these key decisions is the choice of a POS terminal, with banking terminals being particularly recommended due to the advantages they offer in terms of security, institutional backing, and access to complementary financial services.

The Tecamac Supply Center, as an important hub of commercial exchange, clearly demonstrates the positive impact of POS terminals. These solutions are backed by recognized financial institutions, and the use of POS terminals can open the door to lines of credit, financial history, formalization, and better conditions for business growth.

Implementing the use of POS terminals at the Tecamac Central Market not only strengthens trust between merchants and consumers,but also promotes financial inclusion and accreditation of local commerce.

Analyzing these differences not only allows us to understand how commercial processes are transforming in Tecamac, but also how technological advances are being integrated at different levels of the regional economy. This assessment is essential for promoting financial inclusion, commercial efficiency, and the competitiveness of local businesses.

1.3 Functioning and operational benefits of POS terminals at the Tecamac Central Market

POS terminals are easy to use because they are designed for anyone, regardless of their level of technical knowledge, which helps them to operate quickly. This is particularly beneficial for merchants and micro-entrepreneurs who often lack the necessary information about more complex payment systems. The intuitive interface of the mobile applications that accompany these devices facilitates not only payment registration, but also the issuance of digital receipts and sales management, which is essential for maintaining effective control of business finances (Ríos, 2023).

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POS terminals promote transaction security by enabling contactless payments, and the option to send payment links reduces the risks associated with handling cash, which can be stolen or lost. This increase in security also builds trust among consumers, who are more likely to spend when they know their data is protected.

POS terminals represent a revolution in the way merchants conduct their transactions. Their ease of use, low cost, and ability to promote financial inclusion make them an invaluable tool, especially for micro-enterprises and informal merchants. As we move toward a more digital future, these technologies are likely to continue to play a crucial role in the growth and modernization of local commerce, contributing to the sustainability and exposure of the economy in communities such as the Tecamac Central Market.

In an era of digital transformation and modernization of commerce, non-bank POS terminals have emerged as a highly effective technological alternative for small merchants and informal businesses. At the Tecamac Central Market, where these types of establishments predominate, the incorporation of these tools has proven to be an accessible, efficient, and strategic solution for improving commercial operations and competitiveness.

POS terminals offer practical and flexible operation, working with wireless connections, Bluetooth with smartphones, or through devices with integrated cards, eliminating dependence on traditional banking infrastructure. This feature allows merchants to accept multiple forms of payment, including debit cards, credit cards, barcodes, and even payment links sent via social media or messaging platforms. This functionality, combined with device platforms, has enabled their application in sales environments, from fixed locations to street markets and regional fairs.

From an operational perspective, these terminals can also optimize sales control and the issuance of digital receipts, which not only improves internal business management but also opens the door to fiscal and financial formalization. This adds to the security benefits, as the reduction in cash use reduces the risk of theft, loss, and counting errors, generating confidence in both merchants and customers.

POS terminals represent a tool for commercial transformation for small businesses in the Tecamac Supply Center. Their cost, ease of use, technological flexibility, and impact on formalization and financial inclusion position them as a viable solution for promoting local economic development and strengthening the transition to a more modern, secure, and competitive commercial ecosystem.

Results

In the digital age, POS terminals have undergone a profound transformation, adapting to changing needs in commerce, and merchants at the Tecamac Central Market are no exception in their use of POS terminals. For this study, 116 interviews were conducted with tenants at this location, 49 of whom use POS terminals.

1. Overview of POS terminal use

In today's commerce, the use of POS terminals has become common practice among merchants at the Tecamac Central Market. with 42% of sellers choosing to use some type of terminal, reflecting a growing trend toward digitization in the sales environment. However, it is notable that the dominant terminals are Mercado Pago and Clip due to their accessibility and ease of use. These tools allow entrepreneurs to receive payments quickly and easily.

On the other hand, bank POS terminals, although less represented in this commercial ecosystem, are explicitly mentioned in some cases as “terminals.” These are usually associated with recognized financial institutions such as BBVA. Despite their inherent advantages, such as greater institutional support and security, their adoption remains limited among merchants at the Central Market, raising questions about the factors that inhibit their penetration in this market.

2. Perceived advantages of POS terminals

Merchants at the Tecamac Central Market highlight several advantages associated with the use of POS terminals. Among the most valued are:

Speed: Transactions made through these platforms are easy, allowing merchants to serve their customers more efficiently and reduce waiting times.

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Security: POS terminals offer a higher level of security than handling cash, which is essential as it reduces the risks associated with theft and loss of cash, according to the Central de Abastos merchants.

Box 3

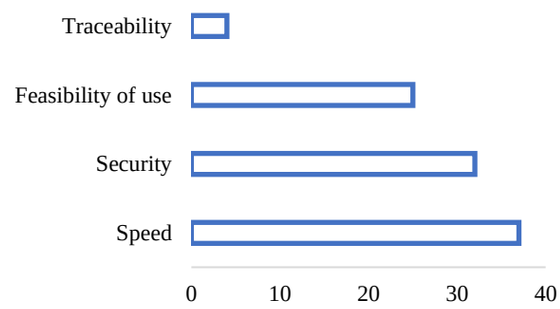

Figure 3
Advantage of digital payments
Source: Own 2025

Note: The graph shows the Central de Abastos merchants' assessment of the security of payment methods.

Ease of use: Both POS terminals have been designed to be easy to use, which encourages their adoption even among merchants with limited technological knowledge.

Although non-bank POS terminals stand out for their operational simplicity and rapid integration into small businesses, bank terminals are notable for providing security and institutional backing. This is a critical issue, given that many merchants are not yet taking full advantage of these benefits.

The payment ecosystem at the Tecamac Central Market is characterized by a varied combination of payment methods. Merchants implement various strategies to optimize their transactions, including:

Combinations of POS terminals and cash: It is common for payments to be completed partly in cash through POS terminals.

Use of POS terminals with bank transfers: some merchants prefer to use transfers, which saves them from having to handle cash, completely bypassing POS terminals.

There are also 23% of merchants in the Central region who use transfers and 35% who use cash exclusively, completely bypassing POS terminals.

However, 18% use POS terminals and transfers, reflecting a hybrid ecosystem where the use of POS terminals is complemented by other traditional methods, especially in businesses with a lower level of formality.

They were asked: Which of the following payment methods does your business mainly use?

Box 4

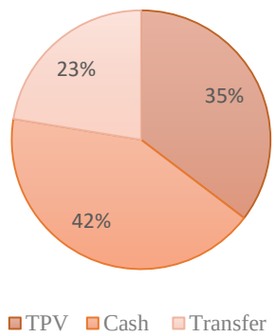

Figure 4
Which of the following payment methods does your business mainly use?
Source: Own 2025

Note: The graph shows the payment methods accepted at the Tecamac Central Market.

3. Level of formalization

A relevant fact is that a large number of establishments keep inventory control, which implies a move towards digitization in the management of their operations. However, it is important to note that those merchants who still record their transactions manually in a notebook or do not keep any formal records tend to rely more on transfers and non-bank point-of-sale terminals.

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Box 6

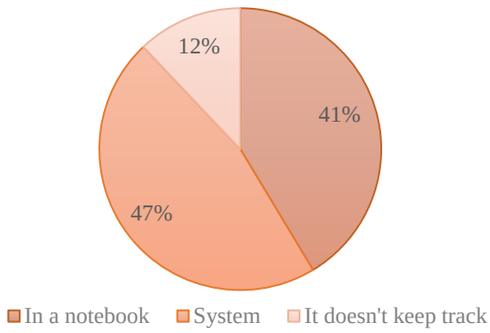

Figure 5

How do you keep track of your merchandise inventory?

Source: Own 2025

This phenomenon suggests that the use of bank POS terminals is associated with a higher degree of formalization in commercial activity. In this sense, the low penetration of bank POS terminals could be linked to a lack of awareness of their benefits or the perception that their implementation would involve more complicated processes.

4. Digital payment platforms

The digital payment platforms most frequently mentioned by merchants include:

– Mercado Pago 43%
– Clip 18%
– Bank point-of-sale terminal 39%

Box 5

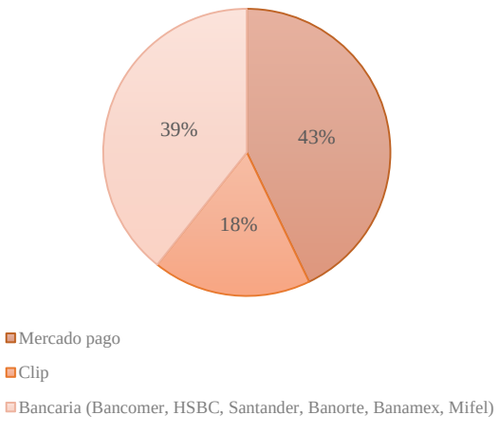

Figure 6

Digital platforms

Source: Own 2025

Note: The graph shows the preference for digital platforms in POS terminals.

This pattern reinforces the idea that small merchants tend to opt for more accessible and straightforward solutions, which, although effective in the short term, do not necessarily provide the robustness and security benefits that bank POS terminals could offer in the short term. The current situation represents a clear opportunity for merchants in the Tecamac Central Market to become banked. There is ample room to promote bank POS terminals, especially for those merchants who have already taken the step toward digitization, as they could benefit significantly from aspects such as financing, fraud protection, and better tax formalization of their operations.

A key recommendation would be to implement training programs and incentives. Many merchants already use basic technology, so offering training could accelerate the adoption of bank POS terminals. Encouraging them to explore these tools and understand their benefits could transform the way they operate and manage their finances.

It is especially important to promote progressive formalization among businesses. bank POS terminals can act as a gateway to the formal financial system, providing merchants with tangible medium- and long-term benefits, not only in terms of security, but also access to credit and other economic opportunities. The transition to more secure payment methods and forms will contribute to the strengthening of the local economy and the sustainable development of the Tecamac community.

Based on an analysis of businesses operating in the Tecamac Central Market, a high willingness to adopt technology in terms of commercial control and payment methods was identified. Sixty-five percent of establishments already implement some type of POS or accept bank transfers, while the remaining 35% continue to operate solely with cash.

It was also observed that 47% of businesses keep track of inventory using digital systems, which shows a trend toward process digitization. However, 41% still use manual methods such as notebooks, and 12% do not keep track of their inventory, which represents an opportunity for operational improvement.

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In terms of the most commonly used payment methods, the combined use of POS terminals, cash, and bank transfers stood out, in addition to other means such as card payments and electronic wallets (only 2%). The banks most commonly used in POS transactions are HSBC, Santander, BBVA, and Banamex, reflecting a diversity of banking options among merchants.

Box 2

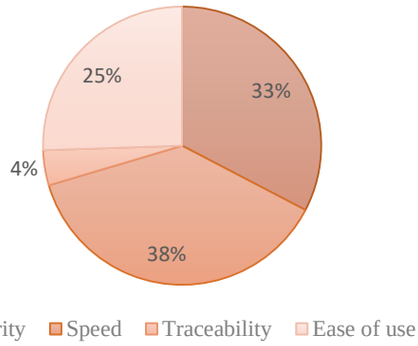

Figure 7
Advantages of using digital payments
Source: Own 2025

Note: The advantages considered by business owners at the Tecamac Central Market are shown.

The main advantages perceived in the use of point-of-sale terminals were speed (38%), security (33%), and ease of use (25%), reflecting a balanced assessment between operational efficiency and risk reduction. Some businesses also identified benefits such as traceability of operations and accounting organization.

These results also allow us to conclude that there is a solid basis for strengthening banking and digitization at the Tecamac Central Market. The data show that most merchants are familiar with basic technological tools and value their benefits, but there are still sectors that lag behind, especially those that operate exclusively with cash and manual means, which opens up an opportunity to implement training, financing, and incentive strategies that promote the universal adoption of bank POS terminals as alternatives.

Conclusions

The proposal to implement both bank and non-bank POS terminals at the Tecamac Central Market proves to be a viable alternative from a technical and financial perspective. Based on the analysis carried out, it is concluded that the existing infrastructure is adequate to carry out this transition and that the return on investment can be realized in a relatively short period, estimated between six and twelve months. This implementation not only responds to a current market need, but also promises to generate a series of tangible benefits in the short and medium term.

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Declarations

Conflict of interest

The authors declare that they have no conflict of interest. They have no competing financial interests or known personal relationships that could have influenced the article.

Autor contribution.

Hernández-Velázquez, Maribel Rocío: Contribuyó a la idea del proyecto, al diseño de la metodogía, análisis de información estadística y a la recolección de información.

Guerrero-García, Sylja Viridiana: Contribuyó a la idea del proyecto, al diseño de la metodogía, análisis de información y a la aplicación de entrevistas.

Colina-Ramírez, Rocío Alejandra: Contribuyó a la revisión del manuscrito y a la aplicación de entrevistas.

Ortiz-Bravo, Alicia: Contribuyó a la revisión del manuscrito y a la aplicación de entrevistas.

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Abreviaciones

TPV Terminal Punto de Venta
RFC Registro Federal de Contribuyentes
EMV Europay, Mastercad y Visa
NFC Technology Near Field Communication

References

Antecedents

Hernández Velázquez, Maribel; Guerrero Garcia, Sylva Viridiana; Estrada Chavira, Maria Eugenia. (2019). Analysis of the use of the point of sale terminals for smes in Mexico. Revista Relayn

Hernández Velázquez Maribel Rocío, Ortiz Bravo Alicia de Jesús, Guerrero García Sylja Viriana y Colina Ramírez Rocío Alejandra. (2024). Análisis del impacto de las Terminales Punto De Venta de las PYMES en la ciudad de México y estado de México en el periodo 2018-2022**.**

Basics

Cabrera Felipe, Mizrahi Nicolás, Moreno Jesús y Zabaleta Pablo. (2023) La rápida evolución de los medios de pago en Latinoamérica. Publicado en McKinsey &Company.

Central de abastos de Tecámac. (2025).

Elizondo Javier. (2025) Comisiones de Terminal Punto de Venta: La Guía para que no le pierdas en tu Negocio. Comercio México.

Noun Project. (05 de diciembre de 2025). *Noun Project*.

Polanco, K. (2025, 01 septiembre). ¿Cuál es la mejor terminal punto de venta en México? *Tiendanube Blog*.

Ríos, L. (2023, 13 de agosto). Central de Abasto de Tecámac tendrá acceso directo a la autopista México-Pachuca. *El Heraldo de México*.

Supports

Banco de México. (2024). Informe anual sobre las Infraestructuras de los Mercados Financieros 2023. Información de acceso público.

BBVA. ¿Qué es el TPV?

COVERMANAGER. (12 de junio de 2024). ¿Qué tipos de TPV hay?

Solís, F. (2023, 14 de agosto). Central de Abasto de Tecamac beneficiará a casi 4 millones de personas. *El Sol de Toluca*.

FacilitaPay. (2021). La evolución de los sistemas de pago: del trueque a lo digital.

Fintech México. (2024). Tendencias para el 2025: el futuro de los pagos.

Sobrado Luna, C. A. (2025). Encuesta Nacional de Inclusión Financiera. Análisis de significancia de indicadores clave en el ingreso de la población de México en 2021. *Revista Equilibrio Económico*, *21*(59), 137-163.

Kholod, M., Celani, A., & Ciaramella, G. (2024). The Analysis of Customers' Transactions Based on POS and RFID Data Using Big Data Analytics Tools in the Retail Space of the Future. Applied Sciences, 14(24), 11567.

Kumar, R. (2021). Artificial Intelligence in Retail. AI Business Review.

Salinas Cesáreo, J. (2022, 31 de agosto). Inauguran primera etapa de la Central de Abasto de Tecamac. *La Jornada*.

PAYCOMET. (2025, 18 de junio). ¿Qué es un TPV físico?

Mordor Intelligence. (2019, 6 de mayo). Mercado de terminales POS de América Latina: crecimiento, tendencias y tamaño.

Yahoo Noticias. (2025, septiembre) Mercado Pago supera el millón de terminales punto de venta en México.

SAGE. (2025, 18 de junio). Sage TPV Online. *Sage*.

SoloPago. (2025). 5 innovaciones en TPV que Re-de-fi-ni-rán México en 2025.

TECNOEMPRESA. (2025, 25 de marzo). Fintechs ganan terreno en el negocio de las TPV mientras la banca se estanca.

Alejandra Vega Barrios, R. J. (2024). *Dialnet*.

ISSN-On line: 2414-4827
RENIECYT-SECIHTI: 1702902

Hernández, Maribel, Guerrero, Sylja, Colina Rocío and Ortiz Alicia. [2025]. Analysis of the implementation of POS terminals at the Tecamac food market, state of Mexico. ECORFAN Journal-Republic of Paraguay. 11[19] 1-11: e31119111
https://doi.org/10.35429.EJROP.2025.11.19.3.1.11

Zettle by Paypal. (junio de 2025). Funciones de TPV para simplificar las ventas.

Mandelbrot, B. B. [2020]. Negative dimensions and Hölders, multifractals and their Hölder spectra, and the role of lateral preasymptotics in science. Journal of Fourier Analysis and Applications Special. 409-432

Polanco Katya (2025). ¿Cuál es la mejor terminal punto de venta? Top 6 en México.

ISSN-On line: 2414-4827
RENIECYT-SECIHTI: 1702902

Hernández, Maribel, Guerrero, Sylja, Colina Rocío and Ortiz Alicia. [2025]. Analysis of the implementation of POS terminals at the Tecamac food market, state of Mexico. ECORFAN Journal-Republic of Paraguay. 11[19] 1-11: e31119111
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Article

Inclusive activities for children to prevent corruption in Nayarit

Actividades infantiles inclusivas para prevenir la corrupción en Nayarit

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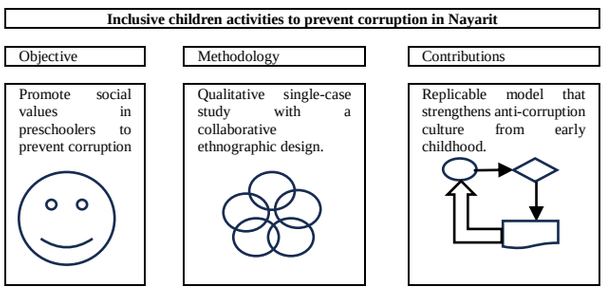
Abstract

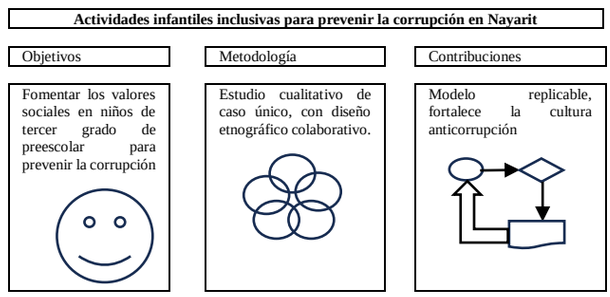
This study presents an educational project aimed at third-grade preschool students in Nayarit, focused on the early prevention of corruption. The proposal is based on Subprogram 4 of the State Anti-Corruption Policy Implementation Program and is aligned with the educational fields of the New Mexican School. Through a collaborative qualitative ethnographic design, three inclusive activities are developed, focusing on the promotion of values, recognition of community services, and participation in collective actions. The program integrates contributions from Piaget, Vygotsky, and Universal Design for Learning to ensure accessibility and pedagogical relevance. The results show that these activities strengthen the understanding of civic values, promote reflection on community life, and encourage children's participation in the prevention of improper practices, contributing to an anti-corruption culture from early childhood.



Preschool, anti-corruption, values

Resumen

Este estudio presenta un proyecto educativo dirigido a estudiantes de tercer grado de preescolar en Nayarit, orientado a la prevención temprana de la corrupción. La propuesta se fundamenta en el Subprograma 4 del Programa de Implementación de la Política Estatal Anticorrupción y se articula con los campos formativos de la Nueva Escuela Mexicana. A través de un diseño cualitativo etnográfico colaborativo, se desarrollan tres actividades inclusivas centradas en la promoción de valores, el reconocimiento de servicios comunitarios y la participación en acciones colectivas. El programa integra aportes de Piaget, Vygotsky y el Diseño Universal para el Aprendizaje para garantizar accesibilidad y pertinencia pedagógica. Los resultados muestran que estas actividades fortalecen la comprensión de valores cívicos, promueven la reflexión sobre la vida comunitaria e impulsan la participación infantil en la prevención de prácticas indebidas, contribuyendo a una cultura anticorrupción desde la primera infancia.



Preescolar, anticorrupción, valores

Area: Dissemination and universal access to science

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Introduction

The fight against corruption in Mexico was strengthened after reforms to 14 articles of the Political Constitution of the United Mexican States (Secretaría Anticorrupción y Buen Gobierno, 2016). One of the most important reforms was made to Article 113, from which the creation of the National Anti-Corruption System (SNA) was derived. This system is composed of institutions whose purpose is to control corruption and promote Local Anti-Corruption Systems (Gobierno del Estado de Nayarit, n.d.). Immediately afterwards, work was carried out on the development of a National Anti-Corruption Policy, from which a federal-level Implementation Program was created, so each state would follow the same process, as was the case in the State of Nayarit.

The Executive Secretariat of the National Anti-Corruption System (SESNA) sent the validation of Nayarit's State Policy proposal to the Local Anti-Corruption System of the State of Nayarit (SESLAN), which was subsequently approved by the SESLAN Coordinating Committee on March 22, 2021 (Secretaría Ejecutiva del Sistema Local Anticorrupción, 2021). Once this proposal was approved, work began on the Implementation Program of the State Anti-Corruption Policy (PI-PEA), resulting in the presentation of this program in October 2024. The program is divided into four subprograms: Combating Corruption and Impunity; Combating Arbitrary Actions and Abuse of Power; Promoting the Improvement of Public Management and Government–Society Points of Contact; and the fourth subprogram, Involving Society and the Private

To address corruption as one of the most significant problems in countries such as Mexico, the National Institute of Statistics, Geography and Informatics (INEGI) has conducted, since 2011, a biennial survey called the Government Quality and Impact Survey (Instituto Nacional de Estadística, Geografía e Informática, 2024). This survey provides information on citizens' perceptions of corruption when using public services and interacting with public servants. For the development of the National Anti-Corruption Policy, data from 2017 were considered, showing that at the national level, 91.1% of people considered acts of corruption to be frequent or very frequent, while in Nayarit the figure was 93.6% (INEGI, 2017).

Following the coordinated efforts mentioned to combat corruption in Mexico, the most recent survey was conducted in 2023 within the timeframe established by INEGI, producing updated results. The perception of the frequency of corruption at the national level was 83.1%, and in Nayarit it was 82.1% (INEGI, 2024). The observed decrease serves as an incentive to continue creating strategies not only for combating corruption, but also for working directly with citizens on prevention.

Considering Subprogram 4 of the PI-PEA, titled Involving Society and the Private Sector, it is deemed appropriate to link the educational sector of the State of Nayarit, as part of the citizenry, to efforts in corruption prevention. This can strengthen educational intervention so that the official programs offered by the New Mexican School (Secretaría de Educación Pública, 2024a) are fulfilled throughout Mexican territory, as well as provide teachers with tools to facilitate their daily practice. Therefore, this project is aimed at third-grade preschool students, which corresponds to Phase 2 and may represent the student's first experience in a formal educational setting (Secretaría de Educación Pública, 2024b).

As background on programs for preventing inappropriate behaviors among Mexican children, it is noted that such programs began more than 10 years ago and were promoted by the Government of Mexico (Secretaría Anticorrupción y Buen Gobierno, 2014), seeking to promote values such as honesty and respect. However, not all of these programs remain active today; most were directed at students starting from 4th grade in primary school (Méndez & Rábago, 2025), or they are implemented in a general manner without specifying age groups, such as the puppet theater activity in the State of Campeche within its program titled "Jaguarcitos de la Honestidad" (Gobierno del Estado de Campeche, n.d.).

Regarding the child population targeted by this project, references exist from China–Hong Kong and Singapore (Secretaría de la Función Pública, 2023). In China, the Independent Commission Against Corruption was created, consisting of three departments, one of which focuses on Community Relations and is responsible for fostering values among people.

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It also offers educational programs for kindergarten, primary school, high school, and university levels. In Singapore, the Corrupt Practices Investigation Bureau contributes to public education and societal integration by disseminating the anti-corruption message.

It is worth noting that, at the international level, the United Nations (UN) shared a 10-step guide developed by 23 young people from 23 member countries of the Youth-Led Integrity Advisory Council, to act against corruption (United Nations Office on Drugs and Crime, 2024). This guide helps young people identify acts of corruption with examples from different sectors, such as education, environmental issues, or the inclusion of people with disabilities, among others; it consistently encourages young people to act in favor of their community and emphasizes that achieving change requires ongoing effort. This UN proposal can be used as a methodology to encourage reflection within the student community particularly among youth while the activities proposed in the guide can be adapted for younger ages.

This project is aimed at the child population of Nayarit who are enrolled in the third grade of preschool during each new school year. It is supported by Subprogram 4: Involving Society and the Private Sector of the Implementation Program of the State Anti-Corruption Policy of the State of Nayarit (PI-PEA), and additionally contributes to the following lines of action presented below, the first of which is short-term and the second long-term (SESLAN, 2024):

– Implementation of training programs, forums, assemblies, meetings, among others, with members of the SLAN to encourage citizen participation and promote ethical principles and values focused on combating corruption.

– Implementation, in collaboration with SEP and the Secretariat of Public Education of the State of Nayarit (SEPEN), of an action plan for the prevention and combat of corruption in the educational sector, including civic education, ethics, integrity, and Human Rights.

Regarding the Study Plan of the Secretariat of Public Education (2024a) developed for basic education in Mexico, this project is based on the following formative fields:

Ethics, Nature, and Societies, which addresses the relationship between human beings and society, as well as the understanding of social, political, natural, and cultural processes.

– Recognition of diverse societies and cultures to exercise critical thinking regarding their histories, customs, traditions, knowledge, and ways of living together, thereby giving meaning and value to their own culture and others.

– Convictions, ethical principles, and democratic values such as respect, freedom, justice, honesty, responsibility, reciprocity, and empathy, which serve as a guide for personal and collective practices, as well as for reflecting and making critical judgments, making decisions, and participating and relating positively and peacefully with others.

– Respect for and protection of human rights as students advance in their educational and life journey, understanding their importance for the organization of social life, learning to defend them in situations of inequality and injustice, and exercising them in an informed and peaceful manner; which implies demanding their enforcement for themselves and for all people, respecting all diversities.

On the Human and the Communal, which acknowledges that human beings interact with their community through a dynamic and continuous process of personal and social construction.

– Promote environments of healthy and peaceful coexistence among members of the educational community, identifying what disrupts these environments.
– Make decisions aimed at modifying behaviors and situations that harm their physical–emotional integrity and that of others.

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– Act in resolving situations and problems present in different contexts, drawing on knowledge, capacities, and skills generated through dialogue among families, school, and community.

– Generate a sense of community and strengthen the sense of belonging, influencing their appreciation of the diversity of identities so they can recognize shared aspects with others when participating in the achievement of goals, the adoption of values, and the design of projects for collective benefit.

For the formative field Ethics, Nature, and Societies, the activities are aligned with the following content:

– Jobs and services that constitute the common good of different families and communities.

– The rights of girls and boys as the basis for comprehensive well-being and for establishing agreements that promote peaceful coexistence.

– The culture of peace as a way of relating to others in order to promote inclusion and respect for diversity.

For the formative field On the Human and the Communal, the activities are aligned with the following content:

– Construction of personal identity based on one's belonging to a territory, ethnic, cultural, and linguistic origin, and interaction with close individuals.

– Emotions within interaction with different people and situations.

– Interaction with people from diverse contexts, contributing to the establishment of positive relationships and coexistence based on the acceptance of diversity.

Legal Framework

Within the Political Constitution of the United Mexican States, Article 3 states that every person has the right to education, that it is the responsibility of the State to guarantee this right, and that education must be compulsory, universal, inclusive, public, free, and secular (Cámara de Diputados, 2024). Therefore, this program for third-grade preschool students is applicable in public or private schools, is free, inclusive, and can be replicated not only in Nayarit but throughout Mexico, making the necessary adjustments according to each state's anti-corruption policy. Being inclusive, it proposes adjustments related to various disability conditions and does not consider the inclusion of elements referring to religions or beliefs.

In Article 113, following the modifications made in 2015, within Title Four on the Responsibilities of Public Servants and State Assets, the creation of the National Anti-Corruption System is established as a coordinating body among authorities belonging to different levels of government and responsible for the prevention, detection, and sanction of administrative responsibilities and acts of corruption, as well as for auditing and overseeing public resources (Secretaría Anticorrupción y Buen Gobierno, 2018).

Within the National Development Plan 2025–2030 (Gobierno de México, 2025), under the general axis titled Governance with Justice and Citizen Participation, education is acknowledged as part of the strategy to strengthen social cohesion through the following objective and strategy:

Objective 1.3: Eradicate corruption in public life and promote ethics, honesty, integrity, and good governance to strengthen trust in institutions.

Strategy 1.3.3 Coordinate efforts with society and the private sector to eradicate corruption and impunity at the national level.

In the general axis Development with Well-Being and Humanism, actions are promoted to strengthen the educational system through the following objective and strategy:

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Objective 2.3 Guarantee the full exercise of the right to an inclusive and equitable education for girls, boys, adolescents, youth, and adults, promoting a humanistic, scientific, intercultural, plurilingual, and holistic education that improves the well-being of the population and drives the country's development.

Strategy 2.3.2 Create optimal environments for learning, coexistence, and the integral development of students through the construction, equipment, restoration, reinforcement, and rehabilitation of educational infrastructure, prioritizing areas with the greatest social disadvantage.

Strategy 2.3.3 Strengthen curricula and study programs in accordance with the principles of the New Mexican School, promoting a comprehensive, critical, environmental, humanistic, civic, intercultural, and scientific education.

In the Nayarit State Development Plan 2021–2027 (Gobierno del Estado de Nayarit, 2021), the foundation for this program is also established, as it appears within the General Education axis, in its single objective and strategy on how to guarantee education:

Strategic Objective 5.4 Guarantee inclusive, equitable, and quality education, and promote lifelong learning opportunities for all.
Strategy 5.4.1 Strengthen education in human values through specialized teaching strategies at all educational levels.

Additionally, within the cross-cutting axis Efficient, Reliable, and Inclusive Government, a cross-cutting strategic objective and a cross-cutting strategy strengthen the legal framework of this program:

Cross-cutting Strategic Objective 13.2: Implement actions that promote a culture of transparency and accountability within every state government agency.

Cross-cutting Strategy 13.2.11: Implement citizen participation processes in the development of public policy.

Therefore, this program is legally aligned with the guidelines that set the direction for the development of both the country and the state. It also helps guarantee the right to education by creating learning environments that promote values enabling students to live harmoniously within their community and avoid participating in inappropriate actions related to corruption. It also strengthens educational institutions to promote citizen participation in combating corruption from early ages, such as third-grade preschool students.

Pedagogical framework

In the development of this program, the contributions of Vygotsky's Sociocultural Theory, Jean Piaget's Constructivist Theory, and Universal Design for Learning (UDL) are considered pertinent for the design of activities, given that, in the case of preschool children, there may be great diversity in terms of the level of knowledge and development among students attending each preschool. Some children may be experiencing formal education for the first time, while for others it may be their third year of formal schooling, in contrast to those who have received care since early childhood education. Therefore, they develop under unique and particular conditions, even if they share common aspects such as the place where they live (Sánchez, 2023).

Piaget Theory

Jean Piaget's Constructivist Theory addresses cognitive development. It highlights childhood as the stage in which the foundations of thought, perception, and language are established (Grupo iLerna, 2025). This theory proposes four stages of cognitive development (Saldarriaga-Zambrano et al., 2016):

The first stage, sensorimotor, which spans from birth to two years of age, in which perception works alongside reflexes according to the stimuli received from the environment, allowing the child to identify the reality around them.

The second stage, preoperational, spans from two to seven years of age, and is further divided into the preconceptual stage (ages two to four) and the intuitive stage (ages five to seven).

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The preconceptual period is characterized by the use of symbols, symbolic play, and language, which involves the ability to think about things or situations that are not present at the moment, rather than limiting themselves to what is physically around them. Children at this stage cannot distinguish between physical, mental, and social realities; they are egocentric because they cannot take on the perspective of others and perceive the world only from their own standpoint. All of this changes during the intuitive stage: they begin to distinguish realities, become more willing to share, can take on the role of others, can think about things that are not currently within their reach, and interact more with others.

The third stage, concrete operations, spans from seven to eleven years of age. At this stage, children's thinking is concrete; they begin developing autonomous morality, become more cooperative, and take others' opinions into consideration.

The fourth stage, formal operations, spans from age 12 onward. In this stage, individuals are capable of thinking in abstract concepts and can engage in debates on topics related to justice or morality.

Vygotsky Theory

According to Vygotsky's sociocultural theory, the development of human potential is influenced by interactions within the socio-historical-cultural context, which has important implications for the teaching–learning process (cited in Moll, 1993). Vygotsky's approach articulates psychological and cultural processes based on the idea that higher functions—memory, attention, problem solving, and reasoning—are the product of sociocultural interactions. Therefore, for Vygotsky, human development is influenced by collective activity, the appropriation of culture through teaching and education, and individual activity. In the educational field, this is known as the zone of proximal development (ZPD), where initially individuals are able to perform certain actions through the interaction and support of others, and later reach their ZPD once they are able to perform these actions autonomously (Matos, 1995).

Universal Design for Learning

At the World Education Forum held in the Republic of Korea (INCHEON, 2015), the Incheon Declaration was approved, establishing the Education 2030 vision: Towards inclusive and equitable quality education and lifelong learning for all (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2015, pp. 31–32; cited in Alba, 2016). This declaration places special emphasis on "promoting lifelong opportunities for quality learning for all, in all contexts and at all educational levels," and highlights key concepts such as equal access to education, quality assurance, flexible learning pathways, and the use of the advantages and potential of ICTs.

Based on the above and in alignment with it, Universal Design for Learning (UDL) is a pedagogical framework that offers multiple approaches to the teaching–learning process. The following are mentioned (Sánchez, 2023; Alba, 2016):

1. Representation: the "what" of learning. This implies that within the body of knowledge to be taught to students, the ways in which information is presented must be designed so that it meets each student's needs, taking into account their different ways of perceiving and understanding (stimulating all senses, as well as providing reasonable adjustments for disability conditions).

2. Expression and Action: the "how" of learning, This occurs after representation. That is, once the content has been presented, taking into account multisensory approaches and reasonable adjustments when necessary, students proceed to express the learning. They have the possibility of demonstrating, according to their abilities, the activities, materials, and other elements, in ways that later allow them to show what they have learned and how they relate to this new content.

3. Engagement: the "why" of learning This refers to the reason why students become meaningfully and actively involved in the learning process.

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4. For this reason, it is vitally important to connect knowledge, neuroscientific evidence, and cognitive sciences related to the processes through which the brain acquires knowledge, so that students can maximize their learning potential. According to Rose and Meyer, each person's learning styles are unique and diverse, hence the need to consider them in order to activate the neural networks involved in learning (2002). These networks are divided into three groups: affective networks (engagement), recognition networks (representation), and strategic networks (expression and action). It is necessary for all three neural networks to be activated at various moments to allow learning to occur in the brain.

Methods

This project is presented as a single case study (N=1), as it is conducted using a qualitative approach with a collaborative ethnographic design, concerning the description and explanation of the object of study (Sánchez, 2019). A collaborative ethnographic design relates to recently recognized fields of knowledge, which combine the activity of two or more disciplines to address specific areas of reality (Reyes, 2022). In this case, education and the fight against corruption are addressed simultaneously. Additionally, it makes it possible to change conditions of power dynamics in school environments (Huerta-Córdova et al., 2021). The objective of this project is to promote social values in third-grade preschool children to prevent improper actions that could affect their community. As an inclusion criterion, it was determined to work with third-grade preschool children, who, according to Piaget's theory, are already able to think about situations and things that are not tangible at the moment they interact with their peers in a particular context. This makes it possible to carry out activities in which children can propose improvements for their community. The selection of participants was carried out based on convenience, according to the objective of the research and the characteristics of the child population, for whom it may be either their first or third year of formal education, as well as their greater capacity to understand the purpose of these activities according to their age (Hernández et al., 2014).

As an exclusion criterion, the activities are not to be applied to first- or second-grade preschool children, since due to the developmental stage they are in, the activities may be too complex, as they are still in the process of acquiring basic social skills that allow them to participate in activities requiring teamwork.

First, an analysis was conducted of the information contained in the PI-PEA (SESLAN, 2024), which presents specific lines of action to combat corruption in the State of Nayarit. Then, the formative fields included in the Synthetic Program of Phase Two, which encompasses the three preschool grades, were identified so that the proposed activities would be aligned with the content and learning development processes that must be addressed in the students. Finally, activity guides were designed, each identified with a name for easy recognition. Each guide includes its objective, materials, estimated time, recommended spaces for implementation, the formative field to which it corresponds according to SEP, the PI-PEA line of action to which the activity is aligned, the development of the activity, and recommendations suggesting ways to implement the activity if there are students with disabilities or other conditions.

Regarding the evaluation of the activities, it is necessary to create a group logbook in which the teacher records students' participation and observations, in order to document the behaviors that appear in the students after each activity, gather their final comments, understand the impact of the activities on them, and determine whether they relate the activities to situations in their daily lives at home, at school, or in their community.

Ethical considerations

In compliance with the Ethical Code of the Mexican Society of Psychology A.C. (2009), prior to the activities contained in this proposal, parents or guardians of the children must complete an informed consent form explaining in detail the protection of the identity of the participating minors, without manipulation or coercion.

Results

Below are three activities to be implemented with third-grade preschool groups.

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Each activity contains the following information: name of the activity, objectives, materials, estimated intervention time, recommended spaces and equipment, activity development, formative fields it strengthens, PI-PEA subprogram to which it contributes, reasonable adjustments corresponding to each activity, and recommendations. The activities strengthen the content and learning development processes of preschool education and therefore may be conducted in any order chosen by the classroom teacher according to their planning.

The three activities are aligned with the Formative fields *Ethics, Nature, and Societies* and *On the Human and the Communal*; also aligned with the the PI-PEA Subprograms

Box 1

Table 1

Activity 1: guardians of values

Guardians of values		
Objective: To identify the types of situations in which values can be applied at home, at school, or in the community		
Materials: Colored sheets of paper for each child and sheets of a different color for the chairs to be used Child-sized classroom chairs A music player with speaker.	Estimated Time: 60 minutes.	Recommended place: Classroom or playground.
Directions This activity is an adaptation of the traditional musical chairs game, except when the music stops there are no losers only winners. Before beginning: The teacher should have on a sheet, for reading aloud, the situations written on colored papers and attached to the chairs, as well as the order of the children who will each have a sheet attached to their uniform identifying them as guardians of a specific value and how they will apply the action to prevent or help solve the situation indicated on the chair where they choose to sit. 1.Two or three teams are created depending on the number of students in the group so that everyone can participate and be guardians of values. 2.Each child is given a colored sheet that is attached to their uniform like a superhero shield. This sheet contains the name of a value and its meaning; the children are told that they are the guardians of… (name of the value). 3.The children are given instructions so they know that they will play almost the same as in musical chairs, except that in this version no one loses; there is an assigned order of guardians who will begin their mission to apply the values. When the music stops, the value corresponding to the child whose turn it is will be read aloud, along with the situation in which the guardian will apply it. 4.A traditional children's song, preferably instrumental so it does not distract from the message of the activity, is played. The children are told that when the music stops, they should sit on any chair of their choice as guardians. 5.The teacher will name the student who will act as the guardian fulfilling their mission, so that student will leave the game while also removing the chair displaying the situation in which they will act as guardian of the value. This continues until all members of the team have had their turn. 6.Another way to carry out the activity is to form small teams and assign the same value to all members, so that the entire team goes out together to fulfill its mission.		
Recommendations: This activity may be carried out over several days of the week, as part of a group project. Frequency helps students to process the information and comprehend values and their application. The teacher might select real situations lived in the school or community to understand that living with values is useful to live better. At the end of the activity the teacher should remind the students that there are public consultations for children in which the students can raise their voices and ask for better services in their communities. In case the group holds handicap students the suggestions are: (visual, motor, and auditory disability adaptations translated literally as follows) Visual: The instructions are explained, and the teacher or another student accompanies the child to prevent accidents. Motor: Slower-paced music may be used if necessary; support is provided depending on the student's autonomy. Auditory: A portable Bluetooth speaker may be used so the child can feel the vibration when the music stops; if not available, the teacher may use a red flag.		

Source: own elaboration based on Méndez & Rábago, 2024, 2025

Box 2

Table 2

Activity 2: my community services

My community services		
Objective: Identificar los servicios públicos y privados de la comunidad		
Materials: Copies of pictograms representing the public services provided in the municipality. Worksheet for students, scissors, and glue sticks.	Estimated time: 60 minutos.	Recommended place: Classroom.
Directions Before beginning: the teacher must prepare the material showing the public and private services that exist—or do not exist—in the municipality so that students can identify them and question why they do not have certain services or how these might be brought to their community, as some services might be far from where they live or might simply not be available at all. 1.Sufficient copies of the services available in the municipality are made for each student, along with another sheet where they can write their name. This sheet is divided into two parts: on the left side, students will place the services they do have, and on the right side, the services they do not have. 2.Students first cut out the pictograms of the services they do have, and then those they do not have in their community, organizing them separately. 3.Students then paste on the left side the services that their community does have. 4.After completing the identification of services, an assembly is held to discuss community services: which services they have and which ones they do not. 5.Students are asked which services they have needed and were able to use, and which services they needed but could not access, whether anyone denied, limited, or hid these services, or whether someone asked them for money in order to provide a service that is supposed to be free. 6.Students are also asked what solutions they propose so that these problems do not happen to them or anyone else again.		
Recommendations: The teacher may select the services that exist and those that do not exist in the community in order to guide the activity according to the preschool context. If there are students with disabilities in the group, the following may be done: *Visual:* For blind students, sheets with different textures or thicknesses may be used so they can distinguish which sheet will be used to paste the services their community has and which one for the services it does not have. They will need help identifying the pictograms; if the child reads braille, the pictograms should be labeled with the main words describing the service so that the student can work autonomously. *Motor:* If the disability affects the lower body, the activity may be done independently. If mobility issues are in the upper body, the student should be asked whether they would like assistance. *Hearing:* If a child has deafness, they may still be acquiring Mexican Sign Language or another form of communication, so they will require direct support from the classroom teacher or support teacher. The images representing public and private community services can be taken from ARASAAC, which provides free resources for creating augmentative and alternative communication systems.		

Source: own elaboration based on Méndez & Rábago, 2024, 2025

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Box 3

Table 3

Activity 3: my community traffic light

My community traffic light		
Objective: To identify community areas for improvement		
Materials: A cardboard traffic light approximately one meter tall, with detachable circles representing red, yellow, and green lights. White sheets of paper and coloring materials for the closing activity.	Estimated time: 20 minutes every day the activity is applied.	Recommended place: Classroom or an outdoor area such as the schoolyard or playground.
Directions This activity may be conducted for approximately 20 minutes each day over a span of four consecutive days, ensuring that the students participating each day receive the appropriate attention, and allowing all students to take part over the four days. On the fifth day, the drawing activity is carried out. Before beginning: the teacher should have the traffic light prepared without the lights, as the lights will be added by the students as they come forward to participate. 1.The group is divided into four teams. Each team participates only one of the four consecutive days assigned to this activity. One day before starting the activity, students may be assigned a task to discuss with their families what is going well in their community, what is going somewhat well, and what is happening that they would not like to occur. The following week, the children share what they discussed with their families. 2.Each time a team participates, the traffic light is displayed, and as each student takes their turn, they are given the three traffic light colors. The children share what they talked about with their families. When they describe what they like most about their community, they attach the green light. When they describe something that is not so good in their community, and that they or their families could help improve, they attach the yellow light. Finally, when they describe something they do not like happening in their community, they attach the red light to the traffic light. 3.After all the students from the team have participated, an assembly is held to discuss what the team shared. This allows the students who did not participate that day to offer solutions to the issues affecting their classmates' communities. 4.On the final day of the activity, after all students have participated (that is, the fifth day), the teacher instructs them to draw a picture showing an action they would like to participate in to improve their community's conditions.		
Recommendations Arrangements may be made to carry out one of the options proposed by the students to improve conditions in their community. For example, planting trees in a local park, cleaning their school by collecting trash after recess, or organizing an activity to raise funds for something beneficial to the community, the school, or their classroom (such as painting a bench in a park or at school, or painting a mural representing the Guardians of Values). If there are students with disabilities in the group, the following may be done: *Visual*: Instructions are explained clearly so the student can participate. The traffic light circles may be made with different materials or textures, but keeping the same colors, so the student can identify each one and participate with the same instructions as the rest of the group. *Motor*: The teacher or support staff can assist students with reduced mobility or those who use a wheelchair. If the student is autonomous, another student or the teacher may stay nearby for safety. If using a wheelchair, materials may be brought closer so the student can participate. *Hearing*: If the student has deafness and is still acquiring Mexican Sign Language or uses another communication method, they will require direct help from the classroom or support teacher.		

Source: own elaboration based on Méndez & Rábago, 2024, 2025

Conclusions

This proposal presents three activities that can be carried out during the school day in third-grade preschool groups. The activities are aligned with the formative fields, content, and learning development processes of the Synthetic Program corresponding to the New Mexican School, which belongs to the second phase of basic education.

Each activity may be completed in two or three sessions in order to meet the estimated time requirements, depending on the dynamics of each group of students and the activity schedule planned by each preschool.

Teachers are encouraged to use these activities according to content development and the context in which the preschool is located, allowing them to take advantage of nearby public spaces or, if necessary, to have the activities focus on what is lacking in the community.

Teachers may conduct the activities in different ways and on various occasions, which will allow them to gather a wide range of proposals from students regarding what they like most about their community, what can be improved, or what they do not like.

It is important that the activities are aimed at promoting values among students—not only so they understand their meaning, but also so they can reflect on them and apply them in their daily behavior, enabling them to avoid actions that go against what is expected of them as guardians of values.

Finally, it is necessary that the activities might not be limited only to identifying areas of opportunity in the community but also be combined with reflection on how students, their families, and their community can participate in improving the place where they live.

Conflict of interest

The authors declare that they have no conflicts of interest. They have no known comopeting financial interests or personal relationships that might have appeared to influence the article reported in this paper.

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Author's contribution

Méndez-Martínez, Myrna: She contributed by designing the collaborative ethnographic method, the Mexican Model of teaching, Piaget Theory, activities and recommendations for disability students.

Rábago-de Ávila, Marcela: Contributed by conducted a comprehensive review of the existing literature on UDL and Vygotsky Theory and Mexican Policies about Anti-corruption and its implementation program. In addition, she elaborated part of the methodology and conclusions.

Accessibility of data and materials

https://docs.google.com/document/d/1gDhTcOAhdPOr0RAMWhZ9DuVgXQ8PDdgp/edit?usp=drive_link&ouid=103258037360682690470&rtpof=true&sd=true

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Abreviaturas

INEGI Instituto Nacional de Estadística, Geografía e Informática
SESLAN Secretaría Ejecutiva del Sistema Local Anticorrupción
SESNA Secretaría Ejecutiva del Sistema Nacional Anticorrupción
SEP Secretearía de Educación Pública
PEA Política Estatal Anticorrupción
PI-PEA Programa de implementación de la Política Estatal Anticorrupción

Referencias

Background

Gobierno del Estado de Campeche. (s/f). Jaguarcitos de la Honestidad.

Méndez M., M & Rábago A. M. (2024). Understanding autism spectrum disorder in Preschoolers: Challenges and opportunities for early educational intervention. International Journal of Human sciences research.

Secretaría Anticorrupción y Buen Gobierno. (2014, 22 de julio). Programas de formación infantil claves para fomentar cultura de legalidad: SFP.

Basics

Alba, C. (2016). Diseño Universal para el Aprendizaje: Educación para todos y prácticas de enseñanza inclusivas. Ediciones Morata.

Cámara de Diputados. (2024, 22 marzo). Constitución Política de los Estados Unidos Mexicanos.

Gobierno del Estado de Nayarit. (n.d). Política Estatal Anticorrupción de Nayarit. Secretaría Ejecutiva del Sistema Local Anticorrupción de Nayarit.

Gobierno del Estado de Nayarit. (2021). Plan Estatal de Desarrollo Nayarit 2021-2027. Con visión estratégica de largo plazo. Instituto de Planeación del Estado de Nayarit.

Gobierno de México. (2025). Plan Nacional de Desarrollo 2025-2030.

Grupo iLerna. (2025, 3 de febrero). La Teoría de Piaget: 4 etapas del desarrollo cognitivo.

Hernandez, R., Fernández, C., Baptista, P. (2014). Metodología de la Investigación (6a ed). Mc Graw Hill

Huerta-Cordova, V., Clemente-Olmos, A. & Córdova-Hernández, L. (2021). El contexto vivo: reflexiones sobre una experiencia etnográfica colaborativa universitaria. magis, Revista Internacional de Investigación en Educación, 14, 1–20.

Instituto Nacional de Estadística, Geografía e informática. (2017). Censo Nacional de Gobierno Federal.

Instituto Nacional de Estadística, Geografía e Informática. (2024) ENCIG 2023. Principales Resultados.

ISSN-On line: 2414-4827
RENIECYT-SECIHTI: 1702902

Matos, J. (1995). El paradigma sociocultural de L.S. Vigotsky y su aplicación en la educación (mimeo). Heredia, Costa Rica: Universidad Nacional.

Moll, L. (1993). Vygotsky y la educación. Buenos Aires: Aique.

Reyes D., M. G. (2022). Etnografía e investigación con niños. Debates contemporáneos. Pergamino.

Saldarriaga-Zambrano, P. J., Bravo-Cedeño, G. R., Loor-Rivadeneira, M. R. (2016). La teoría constructivista de Jean Piaget y su significación para la pedagogía contemporánea. Revista Científica Dominio de las Ciencias. Vol. 2, núm. esp., dic. , 2016, pp. 127-137

Secretaría Anticorrupción y Buen Gobierno. (2016, 9 de septiembre). Reforma en Materia de Combate a la Corrupción.

Secretaría Anticorrupción y Buen Gobierno. (2018, 30 de noviembre). Sistema Nacional Anticorrupción (SNA).

Secretaría de Educación Pública. (2024a). Plan de Estudio para la educación preescolar, primaria y secundaria 2022.

Secretaría de Educación Pública. (2024b). Programa de estudio para la educación preescolar: Programa Sintético de la Fase 2.

Secretaría Ejecutiva del Sistema Local Anticorrupción de Nayarit. (2021, 22 de marzo). Acta de la Primera Sesión Extraordinaria del Comité Coordinador del Sistema Local Anticorrupción del Estado de Nayarit. Acuerdo CC-SESLAN-22032021.04

Secretaría Ejecutiva del Sistema Local Anticorrupción de Nayarit (2024). Programa de Implementación de la Política Estatal Anticorrupción de Nayarit.

Secretaría de la Función Pública. (2023, 11 de enero). El combate a la corrupción en el mundo: 23 experiencias. México. Comité Editorial de la Función Pública.

Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura. (2015). Educación 2030: Hacia una educación inclusiva y equitativa de calidad y un aprendizaje a lo largo de la vida para todos. (12/12/2015)

United Nations Office on Drugs and Crime. (2024). Taking action against corruption. A step by step guide by youth for youth.

Support

Méndez Martínez, M., & Rábago de Ávila, M. (2025). Estudio de Caso: Propuesta de Actividades Infantiles Inclusivas para Prevenir la Corrupción en Nayarit. Ciencia Y Reflexión, 4(3), 696–724.

Rose, D. H., & Meyer, A. (2010). Diseño Universal para el Aprendizaje: Fundamentos neurocientíficos del aprendizaje, cerebro y enseñanza. En C. Alba Pastor (Coord.), Educación para todos y prácticas de enseñanza inclusivas. Morata.

Sánchez F., F. A. (2019). Fundamentos epistémicos de la investigación cualitativa y cuantitativa: consensos y disensos. Revista Digital de Investigación en Docencia Universitaria, 13(1), 102-122.

Sánchez F., S. 2023. El Diseño Universal para el Aprendizaje. GUÍA PRÁCTICA PARA EL PROFESORADO. Narcea Ediciones.

Sociedad Mexicana de Psicología A.C. (2009). Código de Ética de la Sociedad Mexicana de Psicología A.C. Editorial de la Sociedad Mexicana de Psicología A.C.

United Nations Educational, Scientific and Cultural Organization. (2015). World Education Forum 2015: Final report – Programme and meeting document. Education 2030: Towards inclusive and equitable quality education and lifelong learning for all (ED-2015/ws/34). París: UNESCO.

ISSN-On line: 2414-4827
RENIECYT-SECIHTI: 1702902

Méndez-Martínez, Myrna & Rábago-De Ávila, Marcela [2025]. Inclusive activities for children to prevent corruption in Nayarit. ECORFAN Journal-Republic of Paraguay. 11[19] 1-11: e41119111.
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Article

Feasibility and benefit-cost of a digital portal for the agricultural sector

Factibilidad y beneficio-costo de un portal digital para el sector agropecuario

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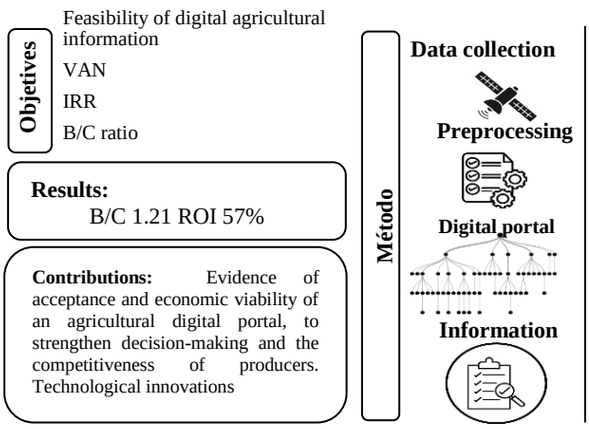
Abstract

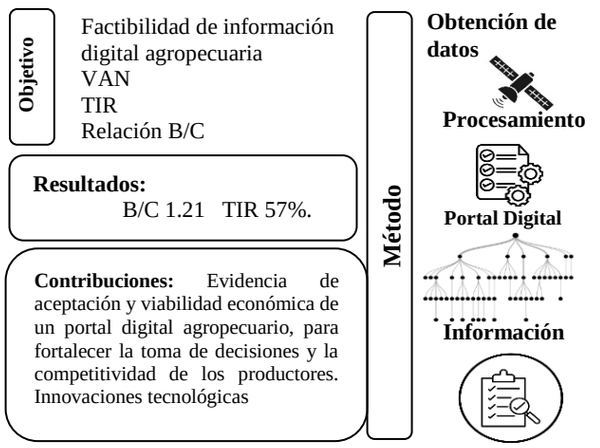
Access to updated information is essential for agricultural producers, as it improves productivity, profitability, competitiveness, and the technical planning of their daily activities. Currently, some producers obtain information through digital tools such as websites, social media, mobile applications, and instant messaging services. The objective of this study was to analyze the feasibility of establishing a digital portal for the agricultural sector in the South-Central region of Chihuahua and to evaluate its benefit–cost ratio. A structured survey was applied to producers, students, researchers, and other sector actors. The research followed a quantitative, applied, and correlational approach. Data analysis was conducted using SPSS through Cronbach's alpha for reliability and chi-square tests for variable association, while Excel was used for the benefit–cost calculation. Results showed high acceptance of the proposed digital portal, with 88.35% of respondents expressing interest in receiving agricultural information, and a benefit–cost ratio of 1.21. The study concludes that this initiative provides a solid foundation for developing a reliable and practical digital platform to strengthen strategic decision-making and enhance producers' competitiveness.



Digital technologies, Information, Primary sector, Decision-making

Resumen

La disponibilidad de información actualizada es esencial para los productores agropecuarios, pues mejora la productividad, rentabilidad, competitividad y planeación técnica de sus actividades. Actualmente, algunos productores acceden a información mediante portales web, redes sociales, aplicaciones móviles y mensajería instantánea. El objetivo de este estudio fue analizar la factibilidad de establecer un portal digital para el sector agropecuario en la región Centro-Sur de Chihuahua y evaluar su beneficio-costo. Se aplicó una encuesta estructurada a productores, estudiantes, investigadores y otros actores del sector. La investigación tuvo un enfoque cuantitativo, aplicado y correlacional. El análisis se realizó en SPSS mediante alfa de Cronbach y pruebas chi-cuadrada, y en Excel para el beneficio-costo. Los resultados mostraron alta aceptación del portal digital: el 88.35% manifestó interés en recibir información agropecuaria, y se obtuvo un índice beneficio-costo de 1.21. Se concluye que el estudio proporciona bases sólidas para una plataforma digital confiable y útil que fortalezca la toma de decisiones y la competitividad de los productores.



Tecnologías digitales, Información, Sector primario, Toma de decisiones

Area: Advocacy and attention to national problems

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Introduction

In the digital age, information is power. In the agricultural sector, access to accurate and timely technical and financial information is essential for making informed decisions and increasing productivity. This becomes an indispensable tool for producers, technicians, and entrepreneurs in the sector, offering centralised access to key resources and data to drive growth and competitiveness. On the one hand, digital technology promotes production, but on the other, it puts at risk the participation of producers, workers, and labourers who do not know how to take advantage of it (Opennhaimer, 2021). Agricultural producers can currently receive this information through digital tools such as platforms, web portals, social networks, instant messaging, and mobile applications; however, there is a gap between a large number of producers in terms of their ability to use these technologies, which limits their use.

Furthermore, there is no centralised source of information on the topics of greatest interest. This reality prevents awareness of opportunities that contribute to the advancement and development of the sector.

Marinchenko (2020) mentioned that McKinsey Global Institute (MGI) specialists pointed out that up to 50% of global labour operations could be automated in the next 20 years. This technological movement is comparable to the industrial revolution that took place in the 18th and 19th centuries. Just as years ago, the availability of roads, water supply, electricity, and infrastructure construction was crucial for manufacturers and producers, today access to fast communications is essential for automating data collection, analysing large amounts of information, and making quick decisions (Serbulova et al., 2019).

It is clear that digital technology and the necessary devices depend on the availability of basic infrastructure for their functioning and operation, such as electricity, the internet, computers, and mobile phones. This infrastructure makes it possible to take advantage of innovations and useful and necessary data to drive the development of productive activities. For example, the United States Department of Agriculture (USDA) is offering loans to invest in digital technologies useful for the agricultural sector (MarketsandMarkets, 2024).

In the particular case of Mexico, in 2019, the National Agricultural Survey highlighted the registration of 4.5 million rural production units, of which 37.7% used some type of technology. However, only 5.5% of producers used computers and 7.8% used the internet. On the other hand, mobile phone use has increased steadily and dynamically among both rural and urban populations, regardless of their economic activity, including agricultural producers (ENA, 2019).

The objective of this study was to analyse the technical, economic and market feasibility of implementing a digital agricultural information portal in the south-central region of Chihuahua using a quantitative approach and a cost-benefit analysis. A structured survey with key questions was administered to producers, students, researchers and other actors linked to the sector. It is hoped that these results will support the creation of the digital portal to encourage agricultural producers in the region to make better decisions and thus strengthen their agricultural activities.

From an economic and market perspective, the research will provide valuable information on the potential for adoption of the digital portal, identifying barriers and opportunities that may influence its long-term sustainability. This will not only benefit agricultural producers by facilitating their access to key information, but will also provide tools to government, academic and business institutions interested in promoting the digitisation of the agricultural sector. This research contributes to the development of information-based strategies to improve the dissemination of agricultural information in the Central-South region, promoting the modernisation of the sector and facilitating informed decision-making. The results may also serve as a basis for technological projects aimed at the digitisation of the agricultural sector in the Central-South region of the state of Chihuahua.

Materials and methods

The study was carried out in the Central-South region of the state of Chihuahua, located in the heart of the state, and represents an area of great social and economic importance due to its agricultural, dairy and agro-industrial production, which includes the municipalities of Delicias, Rosales, Saucillo, Meoqui and Julimes.

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The research was conducted from October 2023 to March 2025 and involved agricultural and livestock producers, stakeholders in the sector, students and professors from the Faculty of Agricultural and Forestry Sciences of the Autonomous University of Chihuahua.

A total of 166 questionnaires were administered, exceeding the calculated minimum sample size (n=162), which strengthened the representativeness of the study. Table 1 shows the sample determination. Prior to the application of the surveys, a pilot study was conducted consisting of 15 electronic questionnaires in Google Forms, from which the following data were obtained, applying the following formula suggested by Rubio-Arias et al., (2024).

$$n = \sigma^2(Z^2)/D^2 \quad [1]$$

Market research (survey) was used as the technique for obtaining information. The questionnaire was designed in accordance with the objective set and was structured in three sections. The first identified the main types of information demanded by producers in the region's agricultural sector and its relevance for decision-making in the sector. The second section assessed producers' willingness to use a digital agricultural information portal and identified factors such as level of access to technology and frequency of use of digital tools. The third section considered the design of the portal, i.e., how producers prefer to receive information.

The SPSS (IBM) statistical package was used to analyse these results, performing a reliability analysis using Cronbach's alpha and variable association with the chi-square test.

Economic and financial análisis

Microsoft Excel was used to calculate the total cost of implementing the digital agricultural platform (CTC), taking into account the fixed costs (CF) and variable costs (CV) that will be incurred. Figure 1 shows this relationship. The initial investment and the expenses involved in the design and operation of the portal were analysed.

Box 1

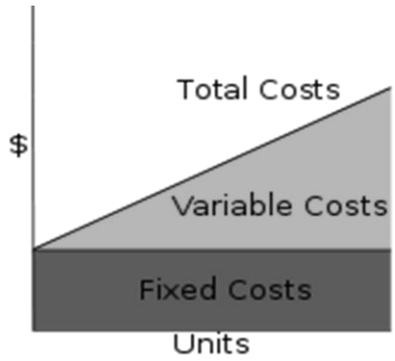

Figure 1
Graph showing the concept of total cost
Source: From Pacheco et al, 2024

For the development and implementation of the portal, investments were considered in computer equipment and servers, software and web development, domain and hosting, furniture, and multimedia and office equipment. In the specific case of expenses for the platform's operational activities, water, electricity, telephone, internet, and salary payments were also considered. With the aim of providing clear and timely information to producers in the agricultural sector.

Box 2

Table 1
Determining the sample size

Level of Education	Number
N Valid	27
Lost	0
Media	34.81
Variance	510.54
D (5%) average	1.74
D (10%) average	3.48
D1^2	3.02
D2^2	12.11
n =	647.43
n=	161.85

Source: Own Elaboration

The investment and expenditure information is used to perform a profitability analysis, considering the financial variables of Net Present Value (NPV), Internal Rate of Return (IRR) and Benefit-Cost Ratio (B/C). The NPV calculation analyses a project's investment based on future income and expenditure (Montes et al, 2023v). As a result, it is possible to know how much would be gained or lost by making a given investment.

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IRR is an indicator of the profitability of projects or investments; thus, the higher the IRR, the greater the profitability (Magni, 2011), thereby supporting good decision-making regarding the investment to be made. With regard to the B/C ratio, this parameter represents the relationship between costs and benefits over a given period. The simplest formula is used to calculate it (Ortega *et al*, 2023).

$$\text{Benefit Cost} = \left(\frac{\text{Net profit}}{\text{Net cost}}\right) \times 100$$

Results and discusión

The results show that most participants expressed a high willingness to receive digital information (88.35%) (Figure 2). This result represents an opportunity to implement technological tools as a means of dissemination. This shows that the adoption of digital technology is not immediate, even when a great deal of effort is invested in encouraging this process. (Dimara y Skuras, 2003).

Box 3

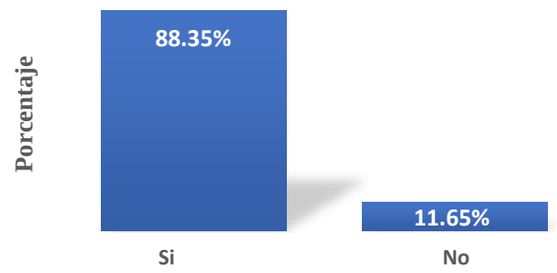

Figure 2

Source: Own Elaboration

People interested in receiving information about the agricultural sector

The information obtained confirms that agricultural producers and other actors in the sector are concerned with input prices (98.54%), government policies and support programmes (65.53%), and, thirdly, financing opportunities (45.63%). This result shows the importance of having reliable and up-to-date information for economic decision-making, which is a key need in this sector. Regarding the ideal frequency for updates, 46.12% prefer to receive information weekly, 30.10% monthly, 16.02% consider biweekly to be adequate, and 7.77% daily.

With regard to the technological devices used, the most common was the mobile phone, with 94.66% of respondents, the laptop or portable computer with 46.60%, and 29.13% other desktop devices. The most accepted formats for receiving information were material with images (40.78%) and videos (29.61%), indicating that producers seek clear, concise, visual content that is easy to understand.

For the economic-financial analysis, cash flow was used to show the initial investment, income, costs, and the discount rate projected over five years (Table 2). A positive NPV of 317,438.00 was obtained, an IRR (57.87%) higher than the evaluation rate, and a benefit-cost ratio of 1.21, which means that each peso invested recovers a surplus of 0.21 pesos (Table 3).

Box 4

Table 2

Cash flow

Year	Total costs ($)	Total revenue ($)	Update factor (%)	Updated costs ($)	Updated income ($)	Discounted net cash flow ($)
0	195,000	0	1.000	195,000	0.00	-195,000
1	319,980	435,000	0.909	290,890	395,454	104,563
2	335,979	456,750	0.826	277,668	377,479	99,810
3	352,778	479,588	0.751	265,047	360,321	95,273
4	370,417	503,567	0.683	252,999	343,942	90,943
5	388,938	585,174	0.621	241,499	363,346	121,847
Total	**1,574,154**	**2,460,078**		**1,523,106**	**1,840,544**	**317,438**

Source: Own Elaboration

Box 2

Table 3

Calculation of financial indicators using a discount rate of 10%

VAN	$ 317,438
TIR	57.87%%
B/C	1.21

Source: Own Elaboration

Conclusions

It is concluded that there is a marked willingness on the part of producers, students, researchers and other actors in the agricultural sector to access information through digital media. This acceptance provides evidence of the need to establish a formal mechanism for the development of a digital portal, which would function as a strategic tool to improve access to up-to-date information, strengthen decision-making and contribute to the competitiveness of the sector.

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Likewise, it is confirmed that the creation of a digital agricultural portal is not only relevant and timely, but also financially viable. The economic analysis carried out with a discount rate of 10% yielded a Net Present Value (NPV) of $317,438, an Internal Rate of Return (IRR) of 57.87% and a Benefit-Cost (B/C) ratio of 1.21, values that indicate favourable profitability and justify the implementation of the project.

Taken together, these results support the conclusion that the design and launch of a digital portal will contribute significantly to improving the availability of reliable and timely information, thereby boosting productive efficiency, strategic planning, and sustainability in the region's agricultural sector.

Recommendations

It is recommended to move forward with the design and implementation of a digital agricultural portal, as the results obtained show high acceptance by stakeholders in the sector and a clear need for reliable, up-to-date and accessible information. This tool has the potential to strengthen decision-making, improve the competitiveness of producers and facilitate the dissemination of technical content in a timely manner.

Given that the financial analysis revealed favourable economic viability, it is suggested that this be used to justify the allocation of resources and ensure the continuity of the project. These indicators support the view that the investment is profitable and that the portal can be sustained in the medium term, especially if it is complemented by strategies for continuous updating and user training.

It is also recommended that the portal's design respond directly to the real needs of producers and other participants in the sector, incorporating relevant content, intuitive technological tools, and feedback mechanisms. This will ensure that the platform is consolidated as a useful, efficient, and widely used resource. It is also suggested that partnerships be established with academic institutions, government agencies, and sector organisations to ensure that information is constantly updated, to strengthen its reach, and to maximise the expected benefits of the project.

Declarations

Conflict of interest

The authors declare that they have no conflict of interest. They have no known competing financial interests or personal relationships that could have appeared to influence the article reported in this article.

Contribution of the authors

Zamora-Domínguez, María Elena: Contributed the project idea and research development.

Ortega-Montes, Fabiola Iveth: Contributed to research direction, data analysis, and editing.

Macías-López, María Guadalupe: I contributed to the research method.

Rubio-Áreas, Héctor Osbaldo: I contributed to data analysis, review, and editing.

Availability of data and materials

The data sets used or analysed during the current study are available from the corresponding author upon reasonable request.

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Abbreviations

TICs	Digital systems that manage emerging technologies
B/C	Cost-Benefit Ratio
CF	Fixed Costs
CTC	Total Cultivation Cost
CV	Variable Costs
TIR	Internal Rate of Return
VAN	Net Present Value

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Information: A set of data with meaning, i.e., that reduces uncertainty or increases knowledge about something. In truth, information is a message with meaning in a given context, available for immediate use and providing guidance for actions by reducing the margin of uncertainty regarding our decisions (Chiavenato, 2006)

Communication: The exchange of information between people. It means making a message or information common. It is one of the fundamental processes of human experience and social organisation. (Chiavenato, 2006).

Dissemination: The action and effect of disseminating (propagating, divulging or spreading). The term, which comes from the Latin diffusio, refers to the widespread communication of a message. (Pérez Porto, 2021)

Specialised Portals: Also known as vertical portals, vortals (from Vertical Portal) or VEPs ('Vertical Enterprise Portal'), they tend to focus exhaustively on one aspect within a geographical or thematic area (finance, current affairs, health, etc.), or adapt their content to the needs of the customer (both information and services). (Baró, et al., 2001).

Market segmentation as 'the way a company decides to group customers, based on important differences in their needs or preferences, with the aim of achieving a competitive advantage' (Thompson, 2005).

References

Background

Marinchenko, T.E. (2020.) Digitalization of agricultural sector: outlook in Russia. The European proceedings of Social and Behavioural Sciences.

MarketsandMarkets, (2024). Digital Agricultural Markets. Reports Code AGI 8180.

Rosenfeld L., M. P. (s.f.). Arquitectura de la Información. Universidad Anáhuac.

Serbulova, N., Kanurny, S., Gorodnyanskaya, A., Persiyanova, A. (2019). Sustainable food systems and agriculture: The role of information and communication technologies. IOP Conference Series: Earth and Environmental Science 403(1): 012127.

Basics

Groher, T., Heitkamper, K., Umstatter, C. (2020). Digital technology adoption in livestock production with special focus on ruminant farming. Animal 14 (11):2404-2413.

Banco Mundial. (2022). Población rural (% de la población total.

Banco Mundial. (2022). Población total. [En línea].

Cámara de Diputados. Agenda (2025). Legislativa del primer periodo de la LXV Legislatura.

Cardoso de Miranda, E. A. (2015). Los sitios web como servicios de información al ciudadano: un estudio sobre los 308 ayuntamientos de Portugal. 18(1). Anales de Documentación.

CEDRSSA (2021). Importancia de la tecnología digital en el sector agropecuario. Centro de Estudios para el Desarrollo Rural Sustentable y la Soberanía Alimentaria.

CEPAL (2021). ¿Es la infraestructura digital existente una limitación para la recuperación?. Comisión Económica para América Latina y el Caribe.

Chiavenato Idalberto (2006). ADH. McGraw-Hill Interamericana, 2006, Pág. 110.

Pacheco, M. B., Macías, L.M., Ortega, M.F., Pérez, J. (2024). Viability of the open-pit cultivation of bell peppers in Meoqui, Chihuahua. Journal Industrial Organization, V-8 N-15 with ISSN: 2524-2105. DOI: 10.35429/JIO.2024.15.8.27.31

Pérez Porto y Ana Gardey (2021). Difusión - Qué es, en la física, definición y concepto.

Ponce. G. M. (2022). Tecnología digital en el sector agropecuario, Revista interactiva Cámara.

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Suport

Dimara E, Skuras D. (2003). Adoption of agricultural innovations as a two-stage partial observability process. Agricultural Economics 28:187–96.

Thompson, I. (2005). La Segmentación del Mercado.

Montes-Sierra, V. A., Uranga-Valencia, L. P., Palacios Monárrez, A., Ortega-Montes, F. I., & Macías-López; M. G. (2023). Business plan for the establishment of a sweet potato (Ipomoea batatas L.) processing plant in Delicias, Chihuahua, Mexico. Agro Productividad.

Ortega, M.F., Rubio, A, H., Clemente, S, F., & Uranga, V, l. (2023). Cost-benefit analysis of the best combination of organic and inorganic sources to supply zinc deficiency in pecan (Carya illinoinensis [wangenh] k. Koch).

Results and discussion

Dimara E, Skuras D. (2003). Adoption of agricultural innovations as a two-stage partial observability process. Agricultural Economics 28:187–96

Serbulova, N., Kanurny, S., Gorodnyanskaya, A., Persiyanova, A. (2019). Sustainable food systems and agriculture: The role of information and communication technologies. IOP Conference Series: Earth and Environmental Science 403(1): 012127.

CEPAL (2021). ¿Es la infraestructura digital existente una limitación para la recuperación?. Comisión Económica para América Latina y el Caribe.

Groher, T., Heitkamper, K., Umstatter, C. (2020). Digital technology adoption in livestock production with special focus on ruminant farming. Animal 14 (11):2404-2413.

.

ISSN-On line: 2414-4827
RENIECYT-SECIHTI: 1702902

Zamora-Domínguez, María Elena, Ortega-Montes, Fabiola Iveth, Macías-López, María Guadalupe and Rubio-Áreas, Héctor Osbaldo. [2025]. Feasibility and benefit-cost of a digital portal for the agricultural sector. ECORFAN Journal-Republic of Paraguay. 11[19] 1-7: e51119107
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Article

Digital Divides and Productive Development in Rural Women: A Systematic Analysis

Brechas Digitales y Desarrollo Productivo en Mujeres Rurales: Un Análisis Sistemático

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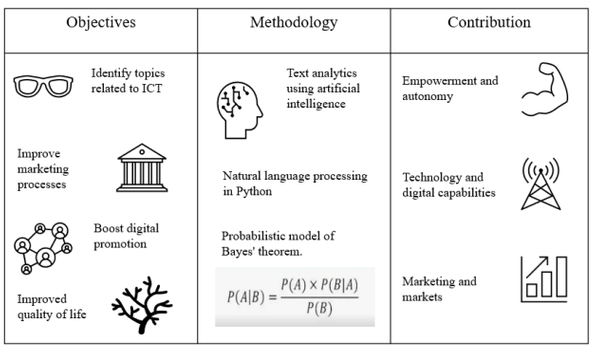
Abstract

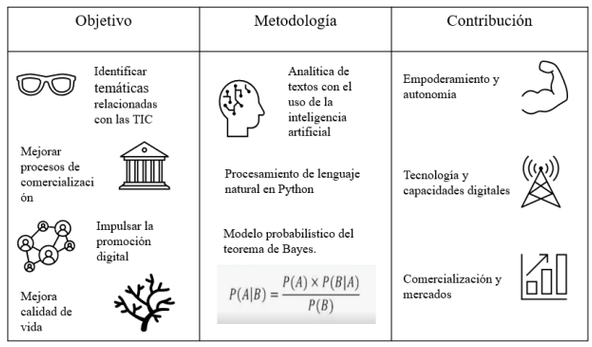
A systematic review based on the PRISMA methodology was conducted to identify themes related to the use of Information and Communication Technologies (ICTs) to empower rural women by improving their cooperative marketing processes and digital promotion, thereby enhancing their quality of life. The analysis included 29 scientific documents, processed through AI-powered text analysis using natural language processing techniques in Python and the Bayesian probabilistic model. The results identified three key topics: 1) The digital literacy gap and its effects on access to entrepreneurship and health; 2) Community empowerment and access to digital resources to improve living conditions in rural areas; and 3) The impact of access to mobile technology on the economic and social development of rural women entrepreneurs. This leads to the conclusion that tools such as smartphones, mobile internet, digital commerce platforms, social media, email, and messaging systems, coupled with technological training and strategic digital adoption plans, are fundamental to expanding the productive opportunities of rural women, strengthening the collective economy, and improving their quality of life.



Rural, Women, Digital technologies

Resumen

Revisión sistemática basada en la metodología PRISMA, con el objetivo de identificar temáticas relacionadas con el uso de las Tecnologías de la Información y la Comunicación (TIC) con el fin de empoderar a mujeres rurales mediante la mejora de sus procesos de comercialización cooperativa y promoción digital mejorando. Se incluyeron 29 documentos científicos, procesados a través de analítica de textos con IA, empleando técnicas de procesamiento de lenguaje natural en Python y el modelo probabilístico del teorema de Bayes. Como se resultado se identifican tres tópicos: 1] Brecha de alfabetización digital y sus efectos en el acceso al emprendimiento y la salud, 2] Empoderamiento comunitario y acceso a recursos digitales para mejorar las condiciones de vida en zonas rurales, 3] Impacto del acceso a tecnología móvil en el desarrollo económico y social de las emprendedoras rurales. Se concluyó que las herramientas como los teléfonos inteligentes, el internet móvil, las plataformas de comercio digital, las redes sociales, y los sistemas de mensajería, acompañadas de capacitación tecnológica y planes estratégicos de adopción digital, son fundamentales para ampliar las oportunidades productivas de las mujeres rurales, fortalecer la economía colectiva y mejorar su calidad de vida.



Rural, Mujeres, Tecnologías digitales

Area: Development of strategic leading-edge technologies and open innovation for social transformation

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Introduction

According to the United Nations, micro, small and medium-sized enterprises (MSMEs) account for approximately 90% of all businesses worldwide, generating up to 70% of jobs and contributing up to 50% of global gross domestic product (UN, 2024, p. 2). According to the Organisation for Economic Co-operation and Development, the Development Bank of Latin America and the Caribbean, and the Latin American and Caribbean Economic System, SMEs represent around 99% of all businesses and generate up to 70% of formal employment, making them fundamental organisations for economic development, innovation, and job creation (OECD et al., 2024).

In Latin America, SMEs account for approximately 99.5% of businesses and contribute around 60% of formal employment (OECD et al., 2024), and in Mexico they constitute the majority of the business economy. They represent around 99.8% of the country's economic units and generate around 70% of jobs (INEGI, 2024).

ICTs, such as the internet and smartphones, represent a transformative opportunity for rural communities. They empower women by allowing them to participate more in decision-making and giving them access to new markets. This contributes to economic development and the reduction of gender inequalities. The adoption of e-commerce and digital services allows women to access broader markets, which is reflected in their income (Ma et al., 2023).

The literature suggests that the use of ICTs, e-commerce, social media, digital marketing, and collaborative tools can significantly improve the economic autonomy of rural women, provided that digital literacy, technological infrastructure, and training support are in place. However, the evidence is still fragmentary.

Therefore, this research conducts a systematic review using PRISMA to integrate findings on digital technologies that strengthen the productive and commercial capacities of rural women, particularly those involved in artisanal models. To this end, the following research questions are formulated:

How do ICTs contribute to the economic empowerment of rural women? What barriers limit their access to digital environments? Which digital tools have the greatest potential for productive development? These questions will be answered in the results section.

Methodology

This research involved a systematic review using the PRISMA methodology, with the aim of identifying the current status of ICTs in women-led artisan SMEs and identifying problems related to the use and implementation of ICTs that support these SMEs in achieving economic growth and improving their digital marketing processes, as well as increasing their sales. The introduction justifies the systematic review and outlines the research questions.

Document database

To compile the database of evaluated scientific articles, inclusion and exclusion criteria were applied to discard those that did not meet the objectives of this systematic review and to eliminate some that, although they contained adequate information, did not meet those objectives.

Searches were conducted in the Web of Science, Scopus, and Google Scholar databases, using the terms ‘rural,’ ‘women,’ and ‘digital technologies’ appearing simultaneously [‘women’ AND ‘rural’ AND ‘(digital technologies)’]. The Boolean operators “OR” and ‘NOT’ were not used.

Inclusion criteria

The inclusion criteria considered were that only scientific articles published between 2015 and 2024, indexed in Web of Science, Scopus or Google Scholar, addressing the use of ICTs by rural women, rural entrepreneurship, artisanal production, digital literacy or community empowerment, and available in English or Spanish, would be selected. Exclusion criteria ruled out non-academic documents, studies that did not address gender or the rural context, and articles that lacked methodological clarity. For the analysis, text analytics techniques were used with Python and a latent Bayesian classifier was applied, which identified three dominant topic.

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Box 1

Figure 1

Age groups that do not use computers

Databases	Period	Documents found
Web of Science	2015–2024	312
Scopus	2015–2024	204
Academic Google	2015–2024	444

Source: Own Elaboration

Box 2

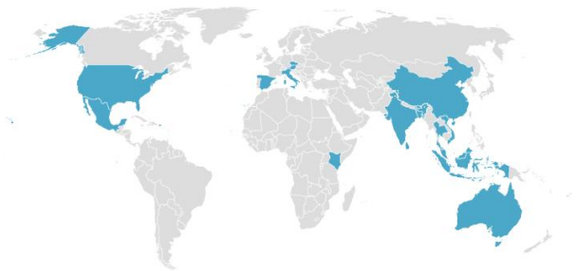

Figure 2

Geographical area

Source: Own Elaboration

Box 3

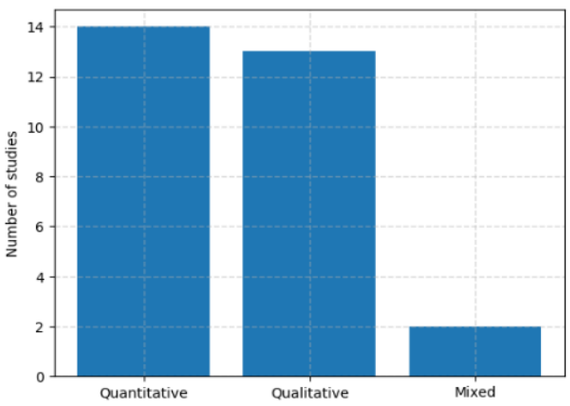

Figure 3

Inclusion criteria

Source: Own Elaboration

Box 4

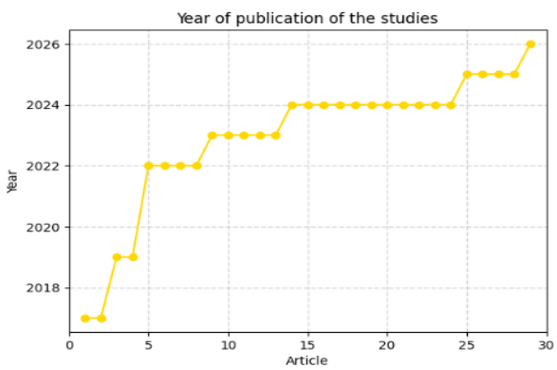

Figure 4

Year of publication

Source: Own Elaboration

After applying the inclusion criteria, 29 articles were selected. Bayesian topic modelling produced three central themes relevant to the digital development of rural women.Topic 1: The digital literacy gap and its effects on access to entrepreneurship and health. Digitalisation is transforming sectors around the world, opening up new opportunities for innovation, efficiency and development.

Women-led businesses use digital technology to drive growth

Inclusive economic growth, promote gender equality and contribute to a sustainable future. To achieve maximum impact and an environment conducive to success, it is essential to provide women entrepreneurs with access to digital tools and resources. Digital technology helps women entrepreneurs optimise operations, increase production and reduce expenses. E-commerce platforms, digital marketing, and cloud computing enable businesses to operate more efficiently, access new markets, and grow faster (Thomas, 2025). Considering new ideas and taking advantage of technological advances are essential variables in helping women entrepreneurs achieve long-term success.

Campaigns that promote digital literacy and the use of technical applications have helped women overcome deeply rooted barriers, access innovative markets, automate business operations, and increase labour productivity (Thomas, 2025). A study conducted in Extremadura, Spain, analysed 400 women over the age of 15, evaluating the role of digital technologies in female entrepreneurship.

The results showed that, despite having access to these technologies, most did not use them for work or business purposes, but mainly for social or entertainment activities. In addition, limited family support for the use of ICTs for productive purposes was identified. Strengthening support networks and providing adequate training to rural women is an effective way to enhance the empowerment opportunities offered by ICTs (Sánchez & Sánchez, 2017).

Consequently, access to ICTs alone does not guarantee equity, but must be accompanied by digital training, adequate technological infrastructure and gender-sensitive public policies.

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Factors such as technical training, institutional support and the building of collaborative networks are essential for rural women artisans to fully reap the benefits of digitalisation. Theme 2: Community empowerment and access to digital resources to improve living conditions in rural areas.In recent years, there has been a considerable increase in research on digitalisation and its impact on rural women, indicating that this is a field of great academic and social interest. However, this increase in publications does not necessarily translate into practical solutions or effective policies that directly benefit these women (Ramasamy et al., 2025).

Collaborative marketing schemes are conceived as an innovative model that allows small producers to share digital resources, optimise distribution channels and increase the visibility of products in virtual environments, thus promoting collective competitiveness and economic sustainability.On the other hand, rural development programmes often lack mechanisms that recognise and redistribute unpaid care work, limiting the transformative potential of gender-focused interventions. Integrating the care economy through time use analysis, adequate infrastructure, and policies that promote gender co-responsibility is essential to ensure real inclusion (Benería et al., 2015; Cruz-Carrasco et al., 2025).

The success of women's empowerment initiatives through the use of ICTs depends on a complex interaction of individual factors such as entrepreneurial skills, resilience and psychological capital, social factors such as family support and professional networks, structural factors such as access to finance and markets, and innovation such as the adoption of digital technologies (Ramos Farroñán et al., 2024).

Theme 3: Impact of access to mobile technology on the economic and social development of rural women entrepreneurs.The use of electronic devices such as smartphones facilitates access to information and provides important communication opportunities, reducing the vulnerability of rural women and, consequently, improving their livelihoods, facilitating better access to local services and markets, and promoting their autonomy (Biswas et al., 2022).

In developing countries, women are 10% less likely than men to use mobile internet, and 26% of these women do not use mobile internet, meaning less access to digital services such as payment and logistics services. This gap limits their participation in digital commerce, affects their economic empowerment, and restricts their use of essential services such as electronic payments and logistics platforms. On the other hand, data shows the positive impact of adopting digital tools in businesses run by women entrepreneurs, provided that there is active and positive training in these tools, infrastructure, and regulatory conditions.

In summary, this article, using data from Alibaba and official data from the United States, Bhutan, and Kenya, demonstrates that the adoption of digital tools and the introduction of women into the digital market represent an economic benefit for women's businesses and enterprises, reducing their exposure to violence and discrimination and reducing the amount of unpaid work time spent on household care tasks (Sicat et al., 2020).Other studies show that women-led SMEs are more likely to use social media for promotion and sales (Alam et al., 2022), reflecting a favourable attitude towards the adoption of digital technologies.

Similarly, international reports have documented that women represent the majority of the unconnected population and that a significant percentage face difficulties in accessing mobile internet due to cost, lack of digital skills and security concerns (Women, 2019).Finally, research conducted in Malaysia indicates that, although most artisans have smartphones and access to Wi-Fi, internet use is often limited. The main barriers to adopting digital tools include costs, limited training, lack of institutional support, and negative perceptions of technology. Recommendations include improving infrastructure, offering digital skills training, and modernising e-commerce platforms (KAMARUDIN et al., 2024).

Discussion of results.To answer the question, ‘How do information and communication technologies contribute to the economic empowerment of rural women?’, the results obtained in this systematic review allow us to affirm that these technologies are a determining factor in strengthening the productive capacities of women in rural contexts.

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Digitisation enables the optimisation of processes, the expansion of market access, and the reduction of costs associated with commercial activities. Several studies indicate that e-commerce platforms, digital marketing, and cloud computing promote more inclusive economic development and enable women entrepreneurs to increase their competitiveness and economic autonomy (Thomas, 2025). Likewise, it has been observed that digital literacy and the strategic use of technological tools facilitate the overcoming of historical barriers linked to access to the labour and productive markets, strengthening their economic and social participation (Kofler & Walder, 2024; Sánchez & Sánchez, 2017).

In relation to the question, 'What barriers limit your access to digital environments?', the review shows that there are structural, technological and sociocultural barriers that restrict rural women's full appropriation of technologies (Othman et al., 2022). The lack of adequate infrastructure, low levels of digital literacy and so-called 'digital poverty' continue to be factors that prevent the full exploitation of technological benefits (Ma et al., 2023).

Added to this are social obstacles, such as limited family and community support for the use of digital tools for productive purposes (Sánchez & Sánchez, 2017). Gender gaps in access to mobile internet also persist; for example, in developing countries, women are 10% less likely to use these services, which affects their access to logistics platforms, electronic payment services, and marketing opportunities (Women, 2019). Taken together, these limitations deepen existing inequalities and restrict women's digital empowerment.

Finally, in response to the question, 'Which digital tools have the greatest potential for the productive development of rural women?', the findings indicate that smartphones, mobile internet and digital commerce platforms are the most relevant and impactful tools (Benavente et al., 2021; Dykha et al., 2021; Palacios, 2003). The use of smartphones facilitates access to information, services, markets and communication networks, helping to reduce socio-economic vulnerability and strengthening personal and community autonomy (Biswas et al., 2022).

E-commerce is identified as a mechanism that increases income and expands the commercial presence of women artisans and entrepreneurs (Ma et al., 2023; Nicola & Setiawan, 2024). Similarly, the use of social media to promote products and services is an effective strategy for improving the visibility and competitiveness of women's enterprises (Alam et al., 2022). Additionally, there is evidence that the introduction of digital tools reduces the time spent on unpaid tasks and facilitates entry into emerging digital markets (Sicat et al., 2020).

Conclusions

After conducting the systematic review and taking into account the classification of the articles analysed, it is concluded that digital transformation is an essential pillar for the productive and social development of rural women. ICTs as a whole consolidate a group of strategic instruments that expand economic capacities and strengthen autonomy by facilitating access to broader, even global, markets. Digital literacy and the availability of technological infrastructure are key factors for the successful integration of e-commerce and mobile internet.

Likewise, the findings confirm that the digital literacy gap persists as a constraint, conditioning the adoption of technologies for commercial purposes and restricting access to information and market opportunities. Overcoming these barriers requires continuous training and capacity-building programmes, as well as public policies to support them. Considering the existing conditions in different rural areas, as they do not have the same levels of infrastructure.

On the other hand, social support is identified as a key element in the effective adoption of ICTs. Collaborative marketing schemes and support networks make it possible to reduce costs, share resources and improve commercial presence, although this impact varies depending on the level of community cohesion achieved.

On the other hand, community empowerment emerges as a key element for the effective adoption of ICTs.

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Collaborative marketing schemes, support networks and social capital make it possible to reduce costs, share digital resources and improve the commercial presence of women in digital environments, although their impact varies depending on the degree of community cohesion.

Finally, it is confirmed that access to technology and mobile internet is a decisive factor in the economic and social development of rural women entrepreneurs. These technologies enable immediate communication, agile business management, and access to financial services and broader markets. However, the magnitude of these benefits depends on the existence of minimal infrastructure and a minimum degree of digital literacy. Taken together, this evidence suggests that the adoption of ICTs must be supported by conscious and context-appropriate technical training, adequate minimum infrastructure, and the strengthening of support networks to generate sustainable and equitable impacts on the lives of rural women

Declarations

Conflict of interest

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

Contribution of the authors

Ramos-Marquez, José Eduardo: Contributed to the introduction, scientific literature search, data management and validation, review and editing of the final work, preparation of results, interpretation of results and conclusions.

Jiménez-García, Martha: Contributed to the scientific literature search, methodology, and descriptive analysis results.

Availability of data and materials

The data are publicly available in the Scopus, Web of Science, and Google Scholar bibliographic databases.

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National Polytechnic Institute.

Abbreviations

ICT: Information and Communication Technologies
SME: Small and Medium-sized Enterprises.

References

Background

Palacios, J. J. (2003). Globalization and e-commerce: Diffusion and impacts in Mexico. *I-Ways, Digest of Electronic Commerce Policy and Regulation*, *26*(4), 195-205.

Benería, L., Berik, G., & Floro, M. (2015). *Gender, development and globalization: Economics as if all people mattered*. Routledge. https://doi.org/10.4324/9780203107935

Sánchez, M. S.-O., & Sánchez, M. R. F. (2017). Digital technologies and rural women's entrepreneurship. *Prisma social*, *18*, 259-277.

Women, C. (2019). The mobile gender gap report 2019. *GSMA, London Retrieved from https://www. gsmaintelligence. com/research*.

Sicat, M., Xu, A., Mehetaj, E., Ferrantino, M., & Chemutai, V. (2020). *Leveraging ICT technologies in closing the gender gap*. World Bank Group.

Basics

INEGI. (2024). *ESTADÍSTICAS A PROPÓSITO DEL DÍA DE LAS MICRO, PEQUEÑAS Y MEDIANAS EMPRESAS (MIPYMES)* (Comunicación social No. 383/24; p. 6). INEGI.

ONU. (2024). *Las MIPYME y los Objetivos de Desarrollo Sostenible*. ONU.

OECD, CAF, & SELA. (2024). *Indice de Políticas para PyMEs: América Latina y el Caribe 2024*.

ISSN-On line: 2414-4827
RENIECYT-SECIHTI: 1702902

Ma, W., McKay, A., Rahut, D. B., & Sonobe, T. (2023). An introduction to rural and agricultural development in the digital age. *Review of development economics*, *27*(3), 1273-1286. https://doi.org/10.33050/sabda

Thomas, A. (2025). Empowering Rural Women in Harnessing Entrepreneurship for Sustainable Development Goals in the Digital Era. En *Empowering Women Through Rural Sustainable Development and Entrepreneurship* (pp. 179-200). IGI Global Scientific Publishing.

Medium

Alam, K., Ali, M. A., Erdiaw-Kwasie, M. O., Murray, P. A., & Wiesner, R. (2022). Digital transformation among SMEs: Does gender matter? Sustainability, 14(1), 535.

Benavente, L. de J. G., Valdez, B. M. D., Hernández, C. V., & Cruz, E. C. O. (2021). Digital technologies as marketing tools to promote commerce in micro and small businesses in Tulancingo de Bravo, Hidalgo, Mexico. *Journal of Hunan University Natural Sciences*, *48*(9).

Dykha, M., Ustik, T., Krasovska, O., Pilevych, D., Shatska, Z., & Iankovets, T. (2021). Marketing Tools for the Development and Enhance the Efficiency of E-Commerce in the Context of Digitalization. *Studies of Applied Economics*, *39*(5).

Biswas, M., Anwar, M., Stillman, L., & Oliver, G. (2022). *Understanding information and communication opportunities and challenges for rural women through the sustainable livelihood framework.* 175-191. https://doi.org/10.1007/978-3-030-96960-8_12

Differences

Cruz-Carrasco, C., Luna-Fuentes, A., Zárate-Nicolás, B. H., Pérez-Flores, M. E., & Toledo-López, A. (2025). To Care and to Produce: Community Participation and Care Economy Among Women in Mexico's Sembrando Vida Program. *Social Sciences*, *14*(9), 518. https://doi.org/10.3390/socsci14090518

KAMARUDIN, K. H., RASHID, M. F., & SHAARI, M. A. (2024). MICRO ENTREPRENEURS'ADOPTION OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) FOR RURAL DEVELOPMENT: EVIDENCE FROM SMALL SCALE POTTERY BUSINESS OF KUALA KANGSAR, MALAYSIA. *Scientific Papers Series Management, Economic Engineering in Agriculture & Rural Development*, *24*(1).

Kofler, I., & Walder, M. (2024). Crafts and their social imaginary: How technological development shapes the future of the crafts sector. *Social Sciences*, *13*(3), 137.

Nicola, G., & Setiawan, R. (2024). Creating competitive advantage through digital innovation: Insights from startupreneurs in e-commerce. *Startupreneur Business Digital (SABDA Journal)*, *3*(2), 131-140.

Discussions

Othman, N., Radin A Rahman, R. S. A., & Kamaruddin, H. (2022). Competences of rural women entrepreneurs and their quality of life. *Sustainability*, *14*(16), 10143.

Ramasamy, I., Saravanan, S. A., Rangasamy, G., & Subramanian, D. (2025). Exploring the impact of digitalisation on rural women's socio-economic status: A bibliometric and scoping study. *Multidisciplinary Reviews*, *8*(2), 2025063-2025063.

Ramos Farroñán, E. V., Arbulú Ballesteros, M. A., Mogollón García, F. S., Heredia Llatas, F. D., Farfán Chilicaus, G. C., Guzmán Valle, M. de los Á., García Juárez, H. D., Silva León, P. M., & Arbulú Castillo, J. C. (2024). Sustainability and Rural Empowerment: Developing Women's Entrepreneurial Skills Through Innovation. *Sustainability*, *16*(23), 10226.

ISSN-On line: 2414-4827
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.

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Article

Women entrepreneurs and the gender gap in business development in the Huasteca Potosina region

Mujeres emprendedoras y brecha de género en el desarrollo empresarial de la huasteca potosina

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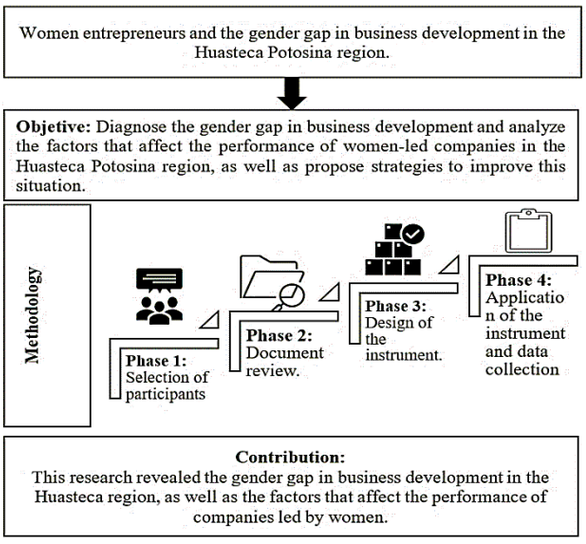
Abstract

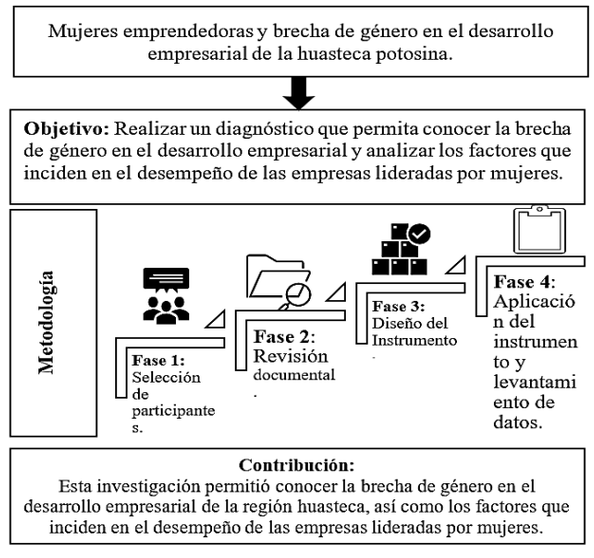
The lack of specific diagnoses in the Huasteca Potosina region on female entrepreneurship prevents us from having evidence that allows us to understand the current situation in this area. Therefore, the objective of this research is to conduct a study that reveals the gender gap in business development and analyzes the factors that affect the performance of companies led by women. To carry out this research, a basic study was conducted using a qualitative approach, an inductive method, and a cross-sectional design, since data collection will be carried out in a single period with a descriptive scope. The study population consisted of women and men entrepreneurs who currently run a business or small enterprise in the Huasteca Potosina region. The main contribution of this work is expected to be the ability to make proposals to improve the situation in this region, taking into account the perspectives of the participants in this study.



Women, Entrepreneurs, Gap

Resumen

La información sobre diagnósticos específicos en la Huasteca Potosina sobre el emprendimiento femenino impide contar con evidencia que permita conocer la situación actual que se vive en esta zona. Por lo anterior, la presente investigación tiene por objetivo: realizar un diagnóstico que permita conocer la brecha de género en el desarrollo empresarial y analizar los factores que inciden en el desempeño de las empresas lideradas por mujeres.Para llevar a cabo la presente investigación se realizó una investigación básica con enfoque cualitativo, bajo un método de tipo inductivo y un diseño de tipo transversal ya que el levantamiento de datos se realizará en un solo periodo con un alcance de tipo descriptivo. La población objeto de estudio estuvo conformada por mujeres y hombres emprendedores/as que actualmente dirigen alguna empresa o pequeña empresa en la zona huasteca potosina. Con este trabajo se espera que la principal contribución sea el poder realizar propuestas que permitan mejorar la situación que prevalece en esta región tomando en consideración la perspectiva de las personas participantes en este estudio.



Mujeres, Emprendedoras, Brecha

Area: Development of strategic leading-edge technologies and open innovation for social transformation

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Introduction

Currently, most companies are mainly made up of men, which, in some ways, can lead to a lack of interest in adopting equality policies within organizations [Sordi et al., 2024]. In terms of workplace equality, one of the areas where inequality prevails is pay [Rivero, 2023].

Female entrepreneurship has established itself as a central phenomenon in the international economy, positioning itself as a driver of innovation, inclusion, and job creation. Currently, more than 128 million women lead companies worldwide, and in countries such as Spain, the number exceeds 650,000, according to the Entrepreneurship Observatory and recent data from the Ministry of Labor and Social Economy [Madrid Chamber of Commerce, 2024].

In Mexico, women represent a growing entrepreneurial force; however, significant gaps persist in access to financing, support networks, value chains, and leadership positions. Recent studies show that female entrepreneurial intent is high, but the survival and growth of their businesses are lower compared to those led by men, according to the Global Entrepreneurship Monitor [GEM, 2024], and the United Nations Development Programme [UNDP, 2025].

Women's entrepreneurship has established itself as a central phenomenon in the international economy, positioning itself as a driver of innovation, inclusion, and job creation. Recent studies show that female entrepreneurial intent is high, but the survival and growth of their businesses are lower compared to those led by men, according to the Global Entrepreneurship Monitor [GEM, 2024], and the United Nations Development Programme [UNDP, 2024].

Women's entrepreneurship has emerged as a key driver of economic and social development in various regions of the world, including Mexico. However, women entrepreneurs continue to face structural barriers that limit their full participation in the business world, especially in rural areas such as the Huasteca Potosina [Pineda-Celaya & Muñoz-Chávez, 2024]. It has also experienced significant growth in recent years [Elam, 2021; GEM, 2023].

However, women continue to face significant barriers to realizing their entrepreneurial intentions. Analysis of these difficulties has led to lines of research that address, on the one hand, entrepreneurial motivations and, on the other, the push and pull factors toward female entrepreneurship [Fernández-Guadaño & Martín-López, 2023]. In this way, female entrepreneurship is consolidating itself as a key component for economic growth, inclusion, and the reduction of inequalities. However, gender gaps persist in access to financing, networks, training, and the time available to devote to business. The Huasteca Potosina region, with its cultural richness and ethnic diversity, presents a complex scenario in which women, despite their growing participation in productive activities, face challenges such as limited access to financing, poor business training, double workloads, and entrenched gender stereotypes [Morcillo Casas, et al 2024]. These conditions perpetuate a gender gap that directly impacts the growth and sustainability opportunities of their businesses.

Theoretical basis

Concept of entrepreneurship and business development

Analyzing entrepreneurship from a gender perspective allows us to identify not only women's participation in business creation, but also the structural barriers that hinder their development. In Mexico, although the presence of women entrepreneurs has increased, inequalities in access to resources, financing, and networks persist, which conditions their contribution to local and regional development [INEGI, 2021; World Bank, 2020].

Entrepreneurship is conceptualized as the process by which individuals identify opportunities, gather resources, and create businesses that generate economic and social value [Schumpeter, 1934; Hisrich & Peters, 2002].

Ratten and Jones, [2021] highlight business education and management as key components in the training of entrepreneurs and business leaders. Although they do not offer a specific definition of business management, relevant aspects of how management and entrepreneurship education influences business management can be extracted.

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Women entrepreneurs: contributions and characteristics

The literature on female entrepreneurship shows recurring patterns: women tend to concentrate in service sectors, commerce, and social economy activities; they combine economic objectives with social goals; and they often develop more collaborative management styles [Brush, de Bruin & Welter, 2009]. In addition, they contribute to local job creation and community resilience, especially in areas with diversified economies [Minniti & Naudé, 2010]. These characteristics require public policies that recognize the heterogeneity of women's entrepreneurship.

Gender gap in entrepreneurship

Access to financing

According to the OECD, women entrepreneurs face structural disadvantages compared to men, particularly in terms of access to financing, venture capital, and business support programs. These inequalities are not due to lower entrepreneurial capacity, but rather to institutional, cultural, and social barriers that negatively influence business development opportunities [OECD/GWEP, 2025].

Women-led businesses receive less external financing and face stricter evaluation criteria for obtaining credit [Carter et al., 2003]. This may be due to discrimination, differences in risk aversion, or structural characteristics of the business.

Social capital and networks

The lack of support networks also has a significant impact, particularly in technological and scientific sectors, where lower female participation limits opportunities for professional growth [Velázquez, 2020]. This inequality particularly affects female heads of household. Likewise, women's limited participation in business networks and decision-making spaces reduces their visibility and access to strategic opportunities. Recent studies highlight that entrepreneurial ecosystems continue to be dominated by masculinized structures, which hinders the full integration of women and reinforces dynamics of exclusion [Journal of Business Research, 2025].

In municipalities such as Tamazunchale, these barriers manifest themselves in limited links with business chambers, incubators, and specialized government programs. In municipalities such as Tamazunchale, these barriers manifest themselves in limited links with business chambers, incubators, and specialized government programs.

Care burdens and use of time

The disproportionate burden of domestic and care work reduces the time available for managing businesses [World Bank, 2020]. This situation is more critical in rural areas, where care services are scarce. Social and cultural barriers continue to limit the development of projects led by women [Saavedra, 2023; Escalante & Merchán, 2024]. On the other hand, Hidalgo-Hidalgo et al. [2022] mention that women must overcome more barriers than men due to social and cultural stigmas. However, they are also agents of empowerment and inclusion.

Stereotypes and cultural norms

Stereotypes about female leadership influence the assessment of women's business skills. In regions with particular cultural traditions, such as the Huasteca Potosina, these norms can represent additional barriers [Ahl, 2006; Gupta et al., 2009]. Despite machismo and the paternalistic labor system, women have become a relevant factor in conflict resolution in the workplace [Aguinaga & Pardo, 2023].

Regional context: the Huasteca Potosina

The Huasteca Potosina region is marked by significant socioeconomic heterogeneity: areas with productive and tourism potential coexist with localities with high levels of marginalization [SEDESORE, 2022]. Official assessments point to infrastructure gaps, low formalization, and limited access to services, factors that affect the viability of local enterprises. CONEVAL [2022] notes that several municipalities face setbacks that affect the availability of economic and human capital. These conditions, combined with cultural patterns documented by regional studies, create a challenging environment for women entrepreneurs [Muñoz Güemes et al., 2020].

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In the Huasteca Potosina region, characterized by challenges of poverty and socioeconomic heterogeneity, specific diagnoses are required to design territorial policies to support female entrepreneurship [SEDESORE, 2022; CONEVAL, 2022].

Background

In Mexico, women's economic participation has increased, but gender gaps persist that limit their inclusion in entrepreneurship, such as less access to financing, insufficient support networks, domestic burdens, and cultural barriers [World Bank, 2020; Brush et al., 2009]. In San Luis Potosí, various studies reveal that the Huasteca Potosina region has high levels of poverty and marginalization [CONEVAL, 2022], which hinders women's entrepreneurial development despite the region's productive and tourism potential [SEDESORE, 2022].

The sectors with the highest female presence include education, health, social assistance, tourism, and services, demonstrating that many women in San Luis Potosí (including those in rural areas) are engaged in work activities, which could facilitate or complement entrepreneurship.

In a study conducted in the Huasteca Hidalguense region, specifically in Huejutla, a descriptive approach and quantitative research were used, with a cross-sectional design that employed an instrument containing five sections covering company size, number of employees, management data, time spent on company tasks, system inputs, system processes, and system outputs. This questionnaire measures the characteristics of the system of each micro and small enterprise, and its results show that the companies are mostly led by men. Likewise, the participating companies belong to the commercial sector and, on average, have been in operation for five years and have an academic level corresponding to a bachelor's degree [Ríos & Rodríguez, 2025].

Contradictorily, in a study conducted by Vázquez [et al., 2025] entitled "The model of development dimensions that explain the obstacles faced by female university students at the Technological University of Huasteca Hidalguense in Huejutla de Reyes, Hidalgo, Mexico, who run micro and small businesses in this location.

The research was based on a qualitative approach, referring to the obstacles faced by female university students who run micro and small businesses, finding that their development will depend on the obstacles faced by Mexican female university students in managing their micro or small businesses. The selection of this approach was based mainly on studying people in their context, in the situations in which they find themselves. We worked with university students and found that their main obstacles are linked to their diverse schedules and the lack of support networks to efficiently carry out their daily tasks.

In the specific context of San Luis Potosí, women entrepreneurs face numerous challenges, including a lack of local opportunities, sociocultural barriers, and gender-based violence in the region [Aldana Balderas et al., 2018], as well as problems related to low income, low labor market participation, discrimination, workplace harassment, risks associated with motherhood, and family responsibilities [Carrillo et al., 2020]. On the other hand, the state faces various motivations and barriers that significantly impact its development and success. Intrinsic motivations, such as the desire for personal and professional improvement and independence, play a crucial role, as do extrinsic motivations, which mainly seek to meet basic needs and generate additional income, especially during adverse situations such as the COVID-19 pandemic [Rivera, et al. 2024].

This study aims to diagnose the gender gap in business development and analyze the factors that affect the performance of women-led businesses in the Huasteca Potosina region, as well as propose strategies to improve this situation. Using a contextual approach, it seeks to highlight the experiences and challenges of women entrepreneurs and recognize their role in the economic and social transformation of the region. Likewise, this study made it possible to generate a diagnosis of the conditions of women entrepreneurs in the region and contribute to the academic literature on gender and entrepreneurship from a territorial perspective.

The article is structured in three sections: (1) theoretical and contextual basis; (2) methodology; (3) results; and finally (4) conclusions derived from the analysis.

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Methodology

To carry out this research, basic research was conducted using a qualitative approach, an inductive method, and a cross-sectional design, since data collection will be carried out in a single period with a descriptive scope.

Subjects: Both men and women were considered entrepreneurs in order to determine which gender (men and/or women) has a greater presence in the Huasteca region at the helm of micro or small businesses willing to participate.

Universe: There is no exact number of entrepreneurs, so a non-probability convenience sample will be used in order to include only those who are willing to participate and respond to the survey.

Instruments: Survey: this instrument measured variables such as the sociodemographic profile of entrepreneurs, opportunities for access to support and training, as well as alternatives and/or proposals they envisage from their role. It consisted of a total of 38 questions, which were answered by entrepreneurs from the municipality of Tamazunchale, S.L.P.

Procedure:

The following phases or stages were carried out to conduct this research:

Phase 1: Selection of participants. At this stage, it was necessary to define the study subjects. In this case, entrepreneurs from the Huasteca region were considered, taking into account their availability to participate.

Phase 2: Document review, through which it was possible to learn about similar works, as well as instruments that were used to collect information in similar studies.

Phase 3: Instrument design. In this activity, the dimensions defined previously and based on the document review were considered. Once the instrument was constructed, it was entered into a form to facilitate its application.

Phase 4: The instrument was applied and data collected using various electronic means such as social media and email, due to the difficulty of accessing some companies. However, other surveys were conducted in person based on the needs and availability of the participants.

Phase 5: Tabulation, analysis, and interpretation of results. To carry out this activity, a database was created in Excel and the results of the instrument applied virtually and in person were included, through which graphs were generated to facilitate the analysis and interpretation of results, which are shown below.

Results

In the content of the article, any tables and figures must be in editable formats that can be changed in size, font type, and font size for editing purposes. They must be of high quality, not pixelated, and must be clearly visible even when the image is reduced in scale.

Box 1

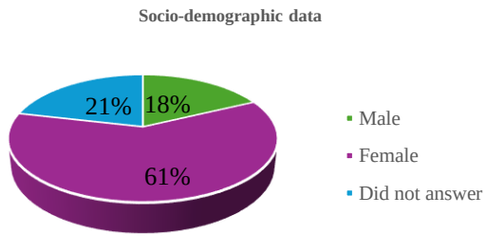

Figure 1
Socio-demographic data
Source: [Own Production, 2025]

According to the total number of participants in this research study, 61% of participants were women, while only 18% were men.

Box 2

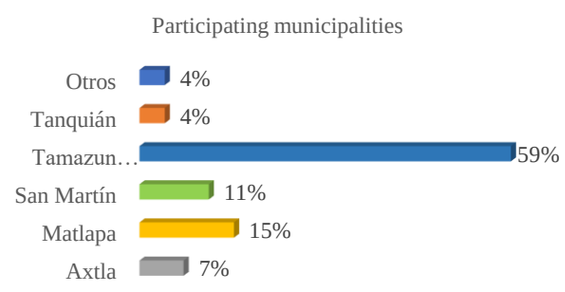

Figure 2
Municipios Participantes
Source: [Own Production, 2025]

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Entrepreneurs from different municipalities in the Huasteca Potosina region participated in this research, including: Axtla de Terrazas, Matlapa, San Martín Chalchicuautla, Tanquián, and Tamazunchale, the municipality with the highest participation rate at 59%. It should be noted that this is one of the most important municipalities in the Huasteca Potosina region, whose economic activity is based on trade.

Box 3

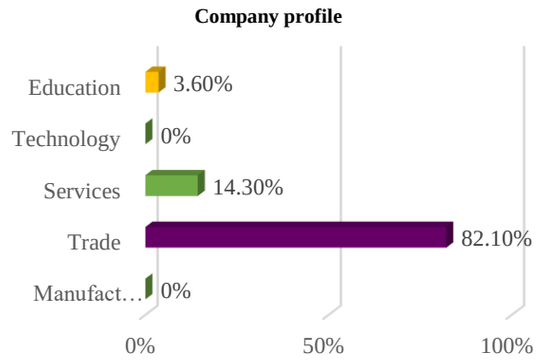

Figure 3
Company profile
Source: [Own Production, 2025]

The sector to which the entrepreneurs considered belong is: 82.1% correspond to the commerce sector. Meanwhile, 14.3% represent the services sector. And only 3.6% represent the education sector.

Box 4

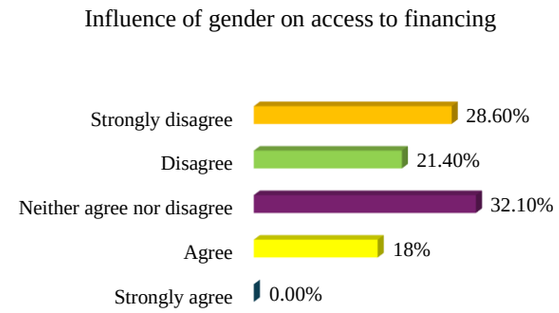

Figure 4
Influence of gender on access to financing
Source: [Own Production, 2025]

When it comes to obtaining credit, 28.6% of participants strongly disagree that their gender has influenced the approval of their credit applications. On the other hand, 21.4% disagree, while 17.9% agree that their gender has influenced their ability to obtain credit.

However, 32.1% neither agree nor disagree that gender has any bearing on the matter.

Box 5

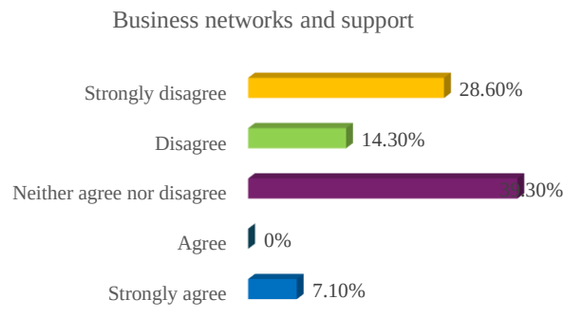

Figure 5
Redees y apoyos empresariales
Source: [Own Production, 2025]

In response to this question, 39.3% said they neither agreed nor disagreed that networks are dominated by men, while 28.6% said they strongly disagreed that they are dominated by men. Contradictorily, 14.3% said they disagreed with the above statement, and only 7.1% perceived that support networks are in the hands of men. It should be noted that 60.7% of the total population surveyed are women.

Box 6

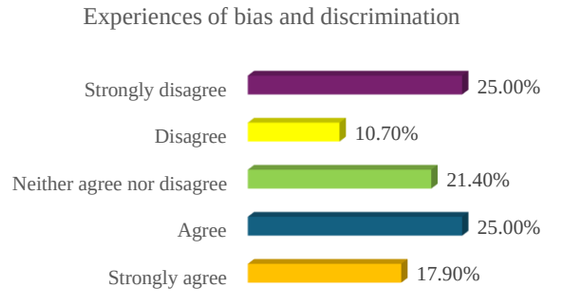

Figure 6
Sexist comments in business contexts
Source: [Own Production, 2025]

46.4% consider that they have not received sexist comments in the business context in which they operate, 21.4% have expressed their disagreement on this issue, while 14.3% are indifferent to this situation. However, 10.7% strongly agree that they have received sexist comments, and 7.1% agree with this statement

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Box 7

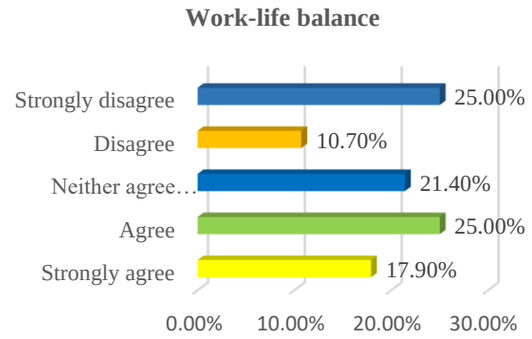

Figure 7
Work-life balance
Source: [Own Production, 2025]

When asked about family responsibilities and the time they devote to the business, 25% agree that these limit the time they devote to the company, while 21.4% neither agree nor disagree. However, 25% of respondents mentioned that they agree that their responsibilities have an impact on the business. On the other hand, 17.9% strongly agree with this situation, and only 10.7% disagree about family responsibilities affecting the time they devote to the business.

Conclusions

Based on the information obtained, it can be concluded that there are more female entrepreneurs in the Huasteca Potosina region of San Luis Potosí, although men are still present, representing a smaller proportion.

It was also found that most of the companies included in this study belong to the commerce sector, which is why most entrepreneurs have perceived that their gender is not an impediment to applying for and being approved for credit. Likewise, in terms of business networks and support, these are no longer dominated by men, although 39.3% showed an indifferent attitude.

When discussing the existence of sexist comments toward entrepreneurs, it is important to mention that most of the entrepreneurs surveyed have not perceived the use of sexist phrases in the business environment.

Likewise, family responsibilities are not perceived as a barrier to performing their family business role.

Therefore, the analysis of women entrepreneurs and the gender gap in business development in the municipality of Tamazunchale, S.L.P., reveals a reality marked by the effort, resilience, and ability of women to promote entrepreneurship.

Although female participation in the business sector is increasing, there are still barriers related to limited access to financing, especially in terms of interest rates, the lack of training to guide them toward improving their business practices, the constant need for support networks, coupled with the overload of family and/or domestic responsibilities that sometimes limit the time they can devote to business activities. Progress is being made in reducing gender stereotypes that minimize their role as economic agents.

To strengthen female entrepreneurship in Tamazunchale, S.L.P., it is necessary to promote gender-focused public policies, contextualized training programs, inclusive financing schemes, and cultural transformation strategies that recognize women as key agents of local economic development (ONU Women, 2025; OECD/GWEP, 2025). These actions are essential to strengthen female entrepreneurship and promote more equitable and sustainable development in regions such as the Huasteca Potosina.Therefore, it can be said that the objective of the research was achieved, which consisted of diagnosing the gender gap in business development and analyzing the factors that affect the performance of companies led by women in the Huasteca Potosina region, as well as proposing strategies that contribute to improving this situation.

Declaraciones

Conflict of interest

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

Authors' Contribution

Mariela Lizeth Martínez Hernández: Contributed ideas for the development of the project and methodology, analysis of information, and fieldwork.

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Mariana Hernández de la Cruz: Made a significant contribution to the application of the instrument and data collection.

Braulio Bautista López: Supported the development of the fieldwork.

Availability of data and materials

The data obtained in this document was the result of the development of an information gathering tool based on dimensions such as: female entrepreneurship, gender gap, access to financing, collaboration networks, and work-life balance. It was designed based on a review of the literature related to female entrepreneurship and the gender gap.

The tool used is available to researchers who are interested in accessing it.

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The research was supported by the Instituto Tecnológico Superior de Tamazunchale, S.L.P.; however, it did not receive any financial funding.

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We would like to thank the Instituto Tecnológico Superior de Tamazunchale, S.L.P, for facilitating this research project, as well as the Head of the Business Management Engineering Program and the students who assisted with the fieldwork.

Abbreviations

CONEVAL	National Council for the Evaluation of Social Development Policy
GWEP	Global Women's Entrepreneurship Policy
INEGI	National Institute of Geography and Informatics
SEDESORE	Secretariat of Social and Regional Development
OCDE	Organización para la Cooperación y el Desarrollo Económicos
ONU	United Nations Organization
S.L.P	San Luis Potosí
UNDP	United Nations Development Programme

References

Background

Aguinaga, M., & Pardo, K. (2023). Empowerment femenino en las empresas. Horizonte Empresarial, 10(1), 61-70.

Aldana Balderas, W. I., Blanes Ugarte, A. V., Rosas Ferruzca, F. J., Aguilar Fuentes, J. A., Vilchis Mora, F. D. J., & García Lirios, C. (2018). Develación del significado del emprendimiento caficultor en jefas de familia. 1961, 1–11

Cámara de Comercio de Madrid. (2024). *El emprendimiento femenino en España: datos y tendencias recientes*. Observatorio del Emprendimiento y Ministerio de Trabajo y Economía Social.

Carrillo, M., Briano, G., & Sánchez, G. (2020). El corretaje inmobiliario en San Luis Potosí: Una perspectiva de género. Tlatemoani, 35, 1–16.

CONEVAL. (2022). *San Luis Potosí: Informe de pobreza y evaluación 2022*.

Secretaría de Desarrollo Económico del Estado de San Luis Potosí (SEDESORE). (2022). *Programa Regional Huasteca Potosina 2022–2027*. Gobierno del Estado de San Luis Potosí.

World Bank. (2020). *Women, business and the law 2020: Mexico*.

Basics

Ahl, H. (2006). Por qué la investigación sobre mujeres emprendedoras necesita nuevas direcciones. *Entrepreneurship Theory and Practice*, *30*(5), 595–621.

Brush CG, de Bruin A, Welter F (2009), "Un marco consciente de género para el emprendimiento femenino". *International Journal of Gender and Entrepreneurship*, Vol. 1 No. 1 pp. 8–24,

Carter, S., Shaw, E., Lam, W., & Wilson, F. (2007). *Gender, entrepreneurship, and bank lending: The criteria and processes used by bank loan officers in assessing applications*. Entrepreneurship Theory and Practice, 31(3), 427–444.

ISSN-On line: 2414-4827
RENIECYT-SECIHTI: 1702902

Martínez-Hernández, Mariela Lizeth, Hernández-De la Cruz, Mariana and Bautista-López, Braulio. [2025]. Women entrepreneurs and the gender gap in business development in the Huasteca Potosina region. ECORFAN Journal-Republic of Paraguay. 11[19] 1-10: e71119110.
https://doi.org/10.35429/EJROP.2025.11.19.7.1.10

ELAM, A. B. (2021). *Women's entrepreneurship 2020/21: Thriving through crisis*. Global Entrepreneurship Monitor.

Escalante, J., & Merchán, D. (2024). Empoderamiento y éxito en emprendimientos artesanales femeninos: El impacto de la educación y la capacitación. *Conrado, 20*(97), 67–74.

Fernández-Guadaño, J., & Martín-López, S. (2023). Gender differences in social entrepreneurship: Evidence from Spain. *Women's Studies International Forum, 96*, Article 102663.

Global Entrepreneurship Monitor Consortium. (2025). *GEM 2025 Women's entrepreneurship report: Navigating challenges, driving change*. Global Entrepreneurship Monitor

Hidalgo-Hidalgo, W., Orellana-Intriago, F., & Bautista-Quijije, E. (2022). Los emprendimientos de las madres solteras de Guayaquil y de otros países de Latinoamérica. 593 DigitalPublisher CEIT, 7(3–2), 220–235

INEGI. (2020). *Panorama sociodemográfico de San Luis Potosí 2020*.

Journal of Business Research. (2025). *Turning the tables towards gender inclusivity in entrepreneurial ecosystems*. *Journal of Business Research, 200*, 115620.

Minniti, Maria, & Naudé, Wim. (2010). *What do we know about the patterns and determinants of female entrepreneurship?* World Development, 38(3), 277–293.

Morcillo Casas, V., Carro Sancristóbal, L., & Madrigal Torres, B. E. (2024). Aportación de la mujer rural emprendedora a la economía: Dos estudios de caso en el sur de Jalisco, México. *La Ventana, 7*(59).

Muñoz Güemes, A., Hernández Hernández, F., & Jasso Castillo, R.. (2020). *Cultura emprendedora entre los estudiantes universitarios en la Huasteca Potosina: Un modelo cultural de dependencia* [Trabajo académico]. Universidad Autónoma de San Luis Potosí.

Pineda-Celaya, L., & Muñoz-Chávez, J. P. (2024). Desigualdad de género y emprendimiento femenino rural en el sureste de México. *Comunicación Científica, 268*(08).

Ratten, V., & Jones, P. (2021). Entrepreneurship and management education: Exploring trends and gaps. *The International Journal of Management Education, 19*(1)

Rivero, E. (2023). ¿A trabajo igual, salario igual? La brecha salarial de género en México: políticas públicas para su disminución. Intersticios Sociales, 27(3), 390-408.

Saavedra, M. (2023). El empoderamiento femenino a través del emprendimiento en la era digital. *Multidisciplinary Business Review*.

Schumpeter, J. A. (1934). *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle*. Harvard University Press. Recuperado de

Sordi, B., Márquez, G., Guerrero, R., & Vallejos, M. (2024). *Empresas y prevención de la violencia de género: ¿Vientos de cambio en la Araucanía?* Revista Universidad y Sociedad, 16(1), 18–29.

United Nations Development Programme. (2024). *UNDP Trends 2024: Global trends report*.

Velázquez, S. C. A., & Amador, E. M. P. (2020). *La brecha digital de género como factor limitante del desarrollo femenino*. Boletín Científico INVESTIGIUM de la Escuela Superior de Tizayuca, 5(10), 22–27.

Support

Rivera, P. T., Rivera, S. C., Monrroy, B. V. T., & Oviedo, A. D.. (2024). *Competencias emprendedoras en la mujer potosina: una perspectiva cualitativa.* FACE: Revista de la Facultad de Ciencias Económicas y Empresariales, 24(2), 36–45.

Differences

Ríos, I. J. S., & Rodríguez, T. M. H.. (2025). *Factores socioculturales y emprendimiento femenino: Principales motivaciones y barreras*. GÉNERO Y EMPRENDIMIENTO SOCIAL, 7.

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Martínez-Hernández, Mariela Lizeth, Hernández-De la Cruz, Mariana and Bautista-López, Braulio. [2025]. Women entrepreneurs and the gender gap in business development in the Huasteca Potosina region. ECORFAN Journal-Republic of Paraguay. 11[19] 1-10: e71119110.
https://doi.org/10.35429/EJROP.2025.11.19.7.1.10

Vázquez, L. L. H., Escudero, C. R., Crescencio, D. N. C., & Morales, C. E. R. Capítulo 18. El modelo del desarrollo de dimensiones que explican los obstáculos de las mujeres universitarias de la Universidad Tecnológica de la Huasteca Hidalguense en Huejutla de Reyes, Hidalgo, México, que dirigen una Micro y Pequeña empresa en Huejutla de Reyes.

World Bank. (2020). Mujeres, empresas y derecho 2020: Mexico (informe).

Discusiones

OCDE/Global Women's Entrepreneurship Policy Network. (2025). *Bridging the finance gap for women entrepreneurs: Insights from academic and policy research*. OECD Publishing.

ONU Mujeres. (2025). *El progreso de las mujeres en el mundo 2025: Igualdad de género y empoderamiento económico*. ONU Mujeres.

.

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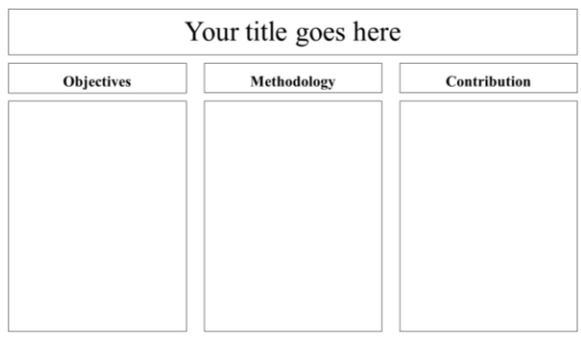

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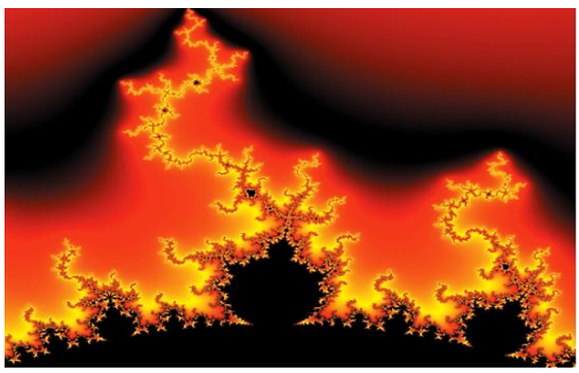

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