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Serrudo-González, Javier

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CDMX.
Diciembre 12, 2025.

Serrudo-González, Javier BsC.

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Variación espacial y temporal de BTEX en Villahermosa, Tabasco, en épocas seca y lluviosa de 2024

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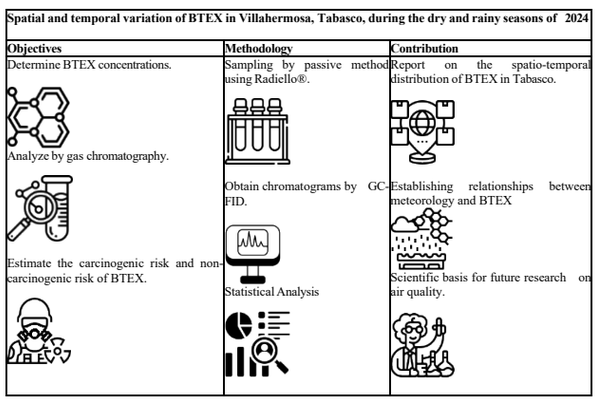
Abstract

BTEX are common volatile organic compounds in urban air that, at high concentrations, can affect the health of the exposed population. In Mexico there are no regulatory limits or continuous monitoring for these compounds. In this study, BTEX concentrations were evaluated by passive sampling at five sites in Tabasco and their health risk during the dry and rainy seasons of 2024. Eighty samples were collected and analyzed by gas chromatography with a flame ionization detector (FID). The relative abundance was B < X < E < T in the dry season and B < X < T< E in the rainy season. The BTEX ratios suggest recent emissions from vehicle traffic. The results show that all sites exceed the US EPA reference risk level (1×10^{-6}), except for the Airport site in the dry season and the football school in the rainy season, with children being the most vulnerable.



BTEX, Passive Sampling, Gas Chromatography

Metallic particulates in pulmonary tissue

Partículas metálicas en tejido pulmonar

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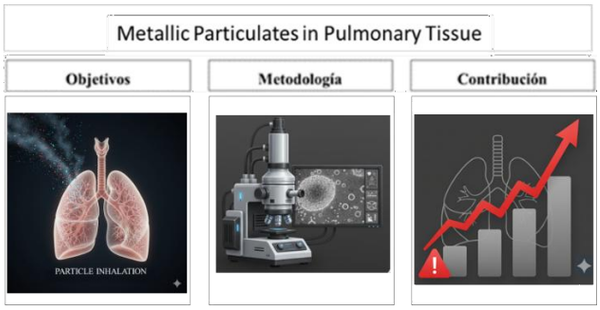
Abstract

This paper examines the toxicological consequences of metal particles (PM 2.5) deposition in lung tissue. Originating from sources such as vehicular traffic (brake/tire abrasion and emissions), these nanoparticles pose a significant health risk, particularly in high-traffic areas. Chronic exposure increases the likelihood of developing lung cancer and other respiratory and inflammatory diseases. The central mechanism of toxicity involves the induction of oxidative stress and the generation of cellular inflammation, leading to DNA damage and the activation of pro-cancer pathways, even in non-smokers. Epidemiological studies confirm an elevated risk for residents living within 500 meters of high-volume roadways.



Metallic Particulates, Pulmonary tissue, PM2.5

3 Medicine And Health Sciences

Emotions in Mayan pregnant women: barriers to care and proposals to reduce them

Emociones en mujeres embarazadas mayas: barreras de atención y propuestas para reducirlas

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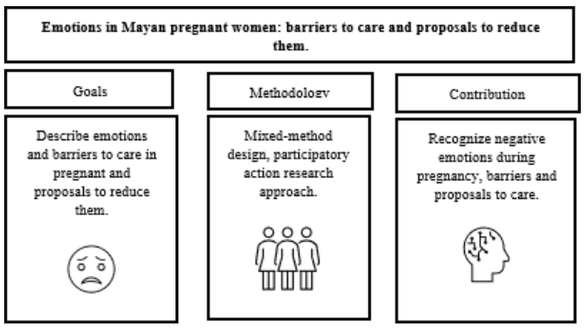
Abstract

Negative emotions during pregnancy can lead the mother to states of anxiety and depression. In Mexico, one in two pregnant women suffers from emotional disorders that are beyond their ability to control. Objective. To describe the main emotions perceived and barriers to care in a sample of pregnant women who attended prenatal care at a community hospital in the southern state of Yucatán, Mexico; and put forward proposals to incorporate the emotional care and risk prevention service. Methodology. A mixed-method design, participatory action research approach, with workshops with focus groups of pregnant women and healthcare personnel. Narrative analysis was used for the qualitative and descriptive analysis for the quantitative. Results. 34 pregnant women and twenty health personnel participated. The emotions perceived were despair, anger, anxiety, euphoria, sadness, fear, frustration, anguish, happiness, and melancholy. Cultural barriers prevailed. Social and personal support for addressing emotional disorders were the main proposals.



Emotions, Barriers, Proposals

4 Humanities and Behavioral Sciences

Fostering meaningful learning in higher education through Artificial Intelligence

Fomentando el aprendizaje significativo en la educación superior a través de la Inteligencia Artificial

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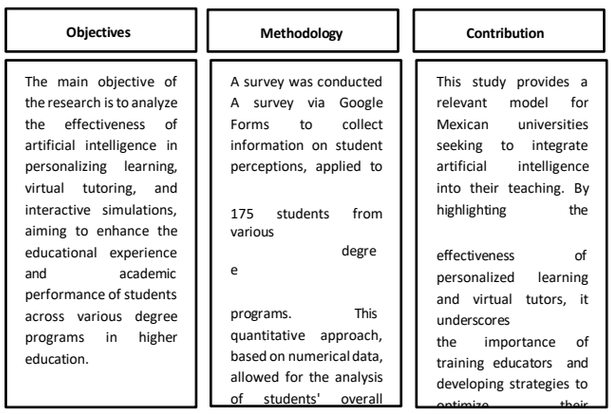
Abstract

The article Fostering Meaningful Learning in Higher Education through Artificial Intelligence explores the application of artificial intelligence in the context of higher education in Mexico. The research, conducted at a public university, focused on 175 students from various undergraduate programs, including Management, Accounting, Marketing and International Business. The main objective was to analyze the effectiveness of strategies such as personalization of learning, virtual tutoring and interactive simulations in improving the educational experience. The research was based on a questionnaire administered through Google Forms, which contained 7 items related to students' perception of these tools. The results indicated that personalization and the use of virtual tutors had a positive impact on knowledge retention and comprehension. In addition, it was observed that interactive simulations facilitated the practical application of theoretical concepts, promoting more accessible and relevant learning. Students emphasized the importance of an approach that encourages reflection and critical thinking, as well as the desire to receive more training on digital tools. Therefore, artificial intelligence presents a significant potential to enrich university education in Mexico. It is recommended that it be integrated into curricula, with a focus on teacher training and the development of effective strategies to maximize its impact on learning.



Artificial Intelligence, Learning, Personalization, Tutoring

A digital didactic strategy for the comprehension of systems of units within blended learning environments

Una estrategia didáctica digital para la comprensión de los sistemas de unidades en entornos de aprendizaje híbridos

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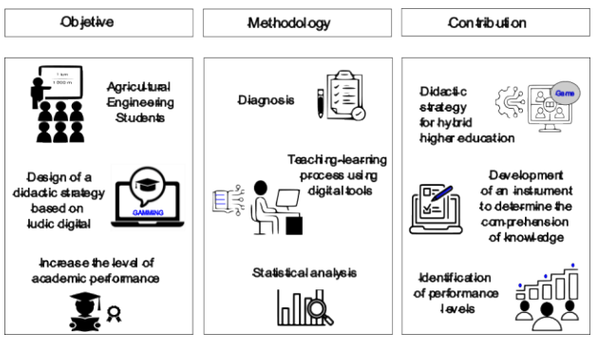
Abstract

This article examines the effectiveness of a digital game-based strategy for teaching Physics to higher education students in a blended learning environment. The study employed a quasi-experimental design involving a control group [CG] and an experimental group [EG]. A survey instrument, validated through the dimensions of comprehension, was used to assess student performance across four key indicators: Knowledge, Method, Purpose, and Communication. Statistical analyses were performed using SPSS version 26, which included normality tests, bivariate correlation, and Student's t-tests. The results demonstrate that the use of a digital teaching strategy in a hybrid format leads to significant improvements in student performance. The study also reveals a strong relationship between the pedagogical intervention and student achievement across all analyzed dimensions, confirming the effectiveness of its application.



Digital Games, Didactic Strategies, Comprehension Of Knowledge

Technological acceptance of the use of AI tools by Mechatronic Engineering students at the UTD

Aceptación Tecnólogica del uso de herramientas de IA en los alumnos de Ingeniería Mecatrónica de la UTD

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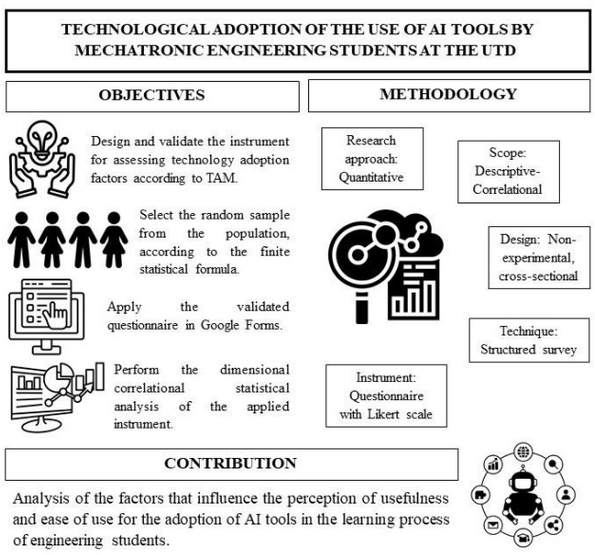
Abstract

This research aimed to evaluate the factors that influence the adoption of AI tools by students at the Technological University of Durango, considering the dimensions of perceived usefulness, perceived ease of use, attitude toward technology, and intention to use, based on the Technology Acceptance Model [TAM]. A twenty-item questionnaire was designed and administered, validated with an Aiken's V coefficient of 0.97 and Cronbach's Alpha of 0.94. This instrument was administered to 149 students, and its statistical analysis showed that perceived usefulness is an important predictor of intention to use, with a correlation r of 0.647, given that students perceive the use of AI in their academic process as useful because it facilitates access to information and makes academic tasks more efficient.



Artificial Intelligence, Perception, Technology Acceptance Model [TAM]

Temple of the Assumption of Our Lady of Tochimilco, Puebla, Mexico, a convent complex belonging to the 16th-century convent route

Templo de la Asunción de Nuestra Señora de Tochimilco, Puebla, México, conjunto conventual perteneciente a la ruta de los conventos del siglo XVI

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Abstract

The contribution of this research is that it rescues the work of researchers who have disseminated the importance of preserving this convent complex, designated a World Heritage Site since 1999. This complex is part of the Route of the 16th-century Monasteries, attracting tourism to a community with a high degree of economic vulnerability that survives primarily on agriculture and tourism. Furthermore, the convent complex is one of the meeting places that allows for community cohesion and the preservation of its cultural identity. Therefore, disseminating its existence can benefit a community and preserve this heritage. The discussion is divided into three parts: The first establishes the importance of the location of the convent complex; the second outlines the concepts that influenced its construction; and the third describes the most relevant components of the complex.

Trade Route, Architecture, and Components

5 Social Sciences

Evaluation of a poultry project for an agribusiness in north of Mexico

Evaluación de un proyecto avícola para un agronegocio en el norte de México

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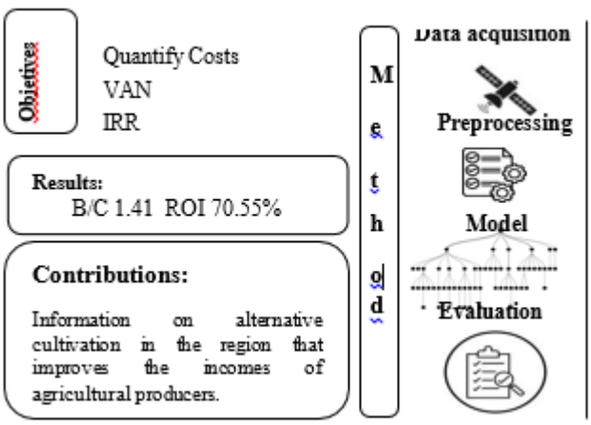
Abstract

The egg is a fundamental food in the world diet due to its high nutritional value, versatility and low cost, it is a basic ingredient in the kitchen and a global nutritional pillar. The objective of this study was to evaluate the feasibility of installing a shed for 200 laying hens, integrating technical, economic and market analyses. Through a cross-sectional non-experimental design, a questionnaire was applied for this purpose in order to identify the potential market. Fixed costs, variable costs [food, infrastructure] and they calculated the financial indicators: NPV, IRR and the Benefit-Cost Ratio. The results of the evaluation confirmed the viability of the project, obtaining NPV indicators: $220,274.02 IRR: 70.55% and a benefit-cost ratio: 1.41, highlighting a local.



Sustainable Poultry, Financial Assessment, Animal Welfare, Food Safety

The 'Sembrando Vida' program as a driver of local economies: an analysis of the commercialization potential of annatto seed [Bixa orellana L.] in the Chontalpa Region, Tabasco

Programa 'Sembrando Vida' como dinamizador de economías locales: un análisis del potencial de comercialización de la semilla de achiote [Bixa orellana L.] en la Región Chontalpa, Tabasco

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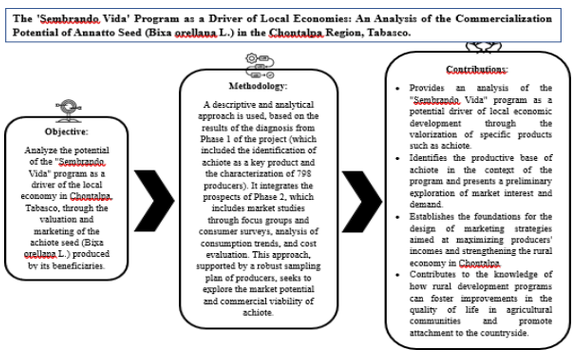
Abstract

This research analyzes the potential of the "Sembrando Vida" program as an agent for dynamizing the local economy in the Chontalpa region of Tabasco, through the commercialization of annatto seed [Bixa orellana L.]. Using a diagnosis of existing production [derived from Phase 1 of projectc and a preliminary market exploration [projected in Phase 2], opportunities to improve producer income and strengthen the rural economy are identified. This analysis lays the groundwork for the development of a specific commercialization model, contributing to the improvement of the quality of life in rural communities and encouraging people to remain in the countryside.



Marketing, Local economy, Development Regional

Comparative strategic analysis of the development poles for wellbeing in San Blas Atempa and Ciudad Ixtepec, Oaxaca, Mexico

Análisis estratégico comparativo de los polos de desarrollo para el bienestar en San Blas Atempa y Ciudad Ixtepec, Oaxaca, México

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Abstract

This article performs a comparative analysis between two key municipalities in the implementation of the Poles of Development for Well-Being [PODEBIS] within the framework of the Interoceanic Corridor of the Isthmus of Tehuantepec [CIIT]: San Blas Atempa and Ciudad Ixtepec, both in the state of Oaxaca. Through EFEM and EFIM matrices, as well as a SWOT approach, the local capacities, risks and strategic opportunities of each territory are evaluated. The results show important contrasts in infrastructure, human capital and social vulnerabilities, but also common areas that must be strengthened to achieve sustainable territorial development.

CIIT, PODEBIS, Territorial development

Rural electromobility: innovation for transportation in indigenous and rural communities

Electromovilidad rural: innovación para el transporte en comunidades indígenas y campesinas

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Abstract

Rural electromobility represents a strategic and innovative alternative for reducing mobility gaps in indigenous and rural communities in southeastern Mexico. This article analyzes the potential for implementing light electric vehicles [tricycles, motorcycles, motorized carts, and community transport] in rural contexts with a focus on sustainability, social justice, and cultural relevance. It presents an assessment of current conditions in rural municipalities in Tabasco, Chiapas, and Campeche, evaluating factors such as energy availability, road infrastructure, public policies, social acceptance, and local technical capabilities. The methodology is based on a mixed approach, using semi-structured interviews with community actors, documentary analysis, and case studies. The findings reveal that, although there are challenges in financing, maintenance, and training, rural electromobility can generate significant benefits: reduced emissions, economic savings, equitable access to services, and strengthening of the community fabric. It concludes that participatory design, local technical training, and coordination with academic institutions can accelerate the adoption of these technologies.



Objective	Methodology	Contribution
Analyse the potential of electromobility as an innovative and sustainable solution to improve access to transportation in indigenous and campesino communities in south-eastern Mexico, identifying barriers, opportunities and implementation strategies suited to the rural context.	A mixed approach is employed. The qualitative part involves conducting semi-structured interviews with community actors, technicians and local authorities, the documentary part analyses case studies, public policies and national and international experiences on rural electric mobility. Municipalities in Tabasco, Chiapas and Campeche are selected as feld study sites for their territorial.	The article provides a contextualized vision of rural electromobility as a tool for territorial equity, social inclusion and environmental sustainability. It offers a framework of participatory implementation based on local capacities, promoting alternative transport models tailored to the needs and realities of south-eastern Mexican indigenous community.

Sustainable transport, Rural electromobility, Territorial inclusión

Innovation in knowledge transmission in the Mexican metal-mechanic industry: Practices and lessons from three strategic sectors

Innovación en la transmisión del conocimiento en la industria metal-mecánica mexicana: prácticas y lecciones de tres sectores estratégicos

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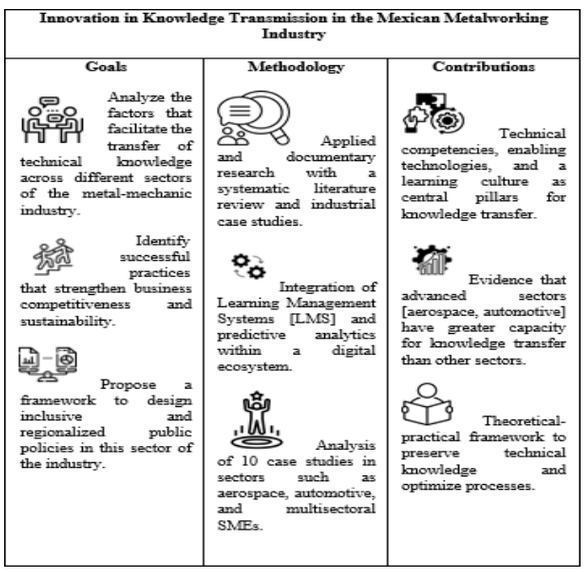
Abstract

This article analyzes innovation in the transmission of technical knowledge in the Mexican metal-mechanic industry. The objective is to understand the factors that facilitate effective knowledge transfer across different sectors, highlighting its strategic relevance for competitiveness and sustainability. The methodology was qualitative and documentary, based on the analysis of scientific literature and the review of ten case studies that illustrate successful practices in dual training, the use of digital platforms, and university-industry collaboration. The results show that the combination of technical competencies, enabling technologies, institutional networks, and organizational culture strengthens knowledge transfer, especially in sectors such as aerospace and automotive. In contrast, SMEs face structural limitations, although they manage to innovate through alliances and support programs. The main contribution lies in offering a referential framework that guides inclusive policies and practices for the management of technical knowledge.



Knowledge Management, Organizational Innovation, Metal-Mechanic Industry, Technical Transfer

Variables that influence the process of linking Higher Education Institutions and Industry

Variables que influyen en el proceso de vinculación de Instituciones de Educación Superior y la Industria

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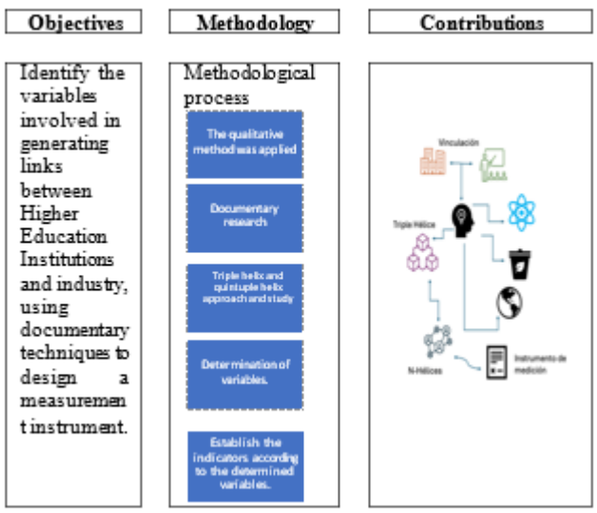
Abstract

This research aims to identify the variables involved in the process of engagement between Higher Education Institutions and industry, using documentary techniques to design a measurement instrument. The research used qualitative methods, documentary techniques, conclusive, descriptive, and cross-sectional approaches. The results show that the variables are focused on the subjects involved in the interaction, considering the needs and context that lead to said interaction. Therefore, it was necessary to establish the elements for each subject of study that allow for the evaluation of the engagement and the obtained products. However, quantitative aspects were also established for the generation of indicators to measure engagement. The research concludes with the determination of the variables that are decisive in the construction of the engagement measurement instrument.



IES, Industry, Variables, Linkage

Gentrification of Cities of Mexico

Gentrificación en Ciudades de México

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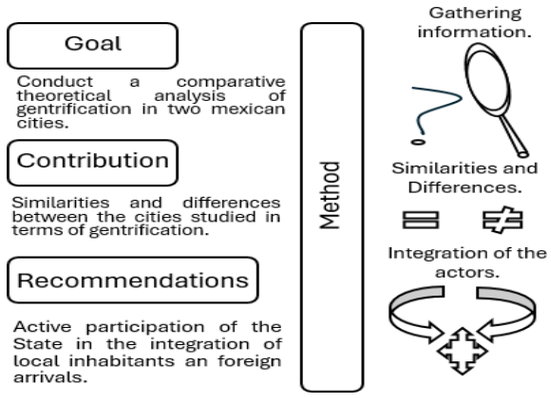
Abstract

The growth of cities leads to a transformation of public spaces and consequently, to the existence of social phenomena such as gentrification**. Objective:** To conduct a comparative theoretical analysis of gentrification in two Mexican cities, regarding the way this social phenomenon has impacted the population and the dynamics experienced within them. **Results:** It was found that the migration of foreigners is due to the fact that the two cities studied offer quality of life, good climate, macro-environmental values and a culture rich in traditions which encourages many visitors to extend their stay, havings as their main benefit to value of their currency. **Conclusions:** Among the main similarities between the cities studied in terms of gentrification are their high cultural value, traditions and nature, that make them atractive to visitors. Among the differences are the urbanization of the city of Merida, Yucatan, Mexico, and the dollarization of the real estate market in the city of San Miguel de Allende, Guanajuato, Mexico.



Gentrification, cities, Merida, San Miguel de Allende

Study of stress in students at the higher level who participate in continuing education

Estudio del estrés en alumnos de nivel superior que participan en la educación continúa

Gómez-Campos, Sinahí Gabriela, Granados-Magaña, Javier Alejandro, Mejía-Salazar, Gilberto And Félix-Pérez, Sirigui Garibeth

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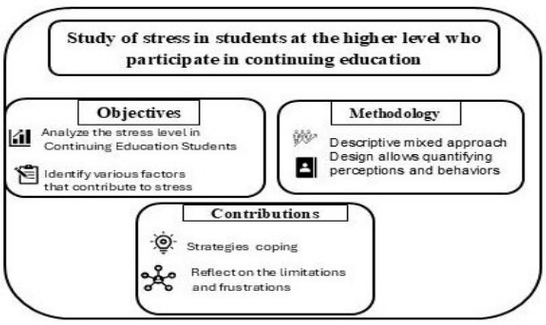
Abstract

This study analyzes the level of academic stress in university students participating in continuing education programs, using a mixed methodology y with validated surveys and statistical analysis using SPSS. The results show that 79% of students experience significant levels of stress related to academic activities, with workload and deadlines standing out as the main stressors. Physical symptoms [headaches, insomnia] and emotional symptoms [anxiety, irritability] are identified as predominant manifestations. The most commonly used coping strategies include time planning, relaxation techniques, and institutional adjustments. The justification focuses on the need to improve the quality of life of students through effective interventions.



Academic stress, Continuing education, Coping.

Perception study on low-cost electric vehicles for urban mobility in Mexico

Estudio de percepción sobre autos eléctricos de bajo costo para movilidad urbana en México

Soto-Hernández, Ana María, Rodríguez-Zapata, J. F. Franklin, Reyes-García, Brenda Lizeth And Maldonado-Soto, Otilia Georgina

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Abstract

The Mexican low-cost electric vehicle market is experiencing substantial growth. Consumer adoption is driven by potential operational savings. The Mexican government has established a project called Olinia, with the goal of producing low-cost electric vehicles for urban mobility, with a proposed price from 4,800 USD to 8,000 USD, targeting a potentially large and underserved segment. An exploratory study of the market in 2025 was conducted with a sample of 148 users in the most populated areas of Mexico to identify their perceptions and preferences. Surveys identified the main purchasing objections as the lack of charging infrastructure and the high initial cost, although many consumers expressed interest in the environmental benefits and fuel savings.

Electromobility, Urban Mobility, Low-Cost Electric Vehicle

Experiences of collaborative work in academic networks

Experiencias de trabajo colaborativo en redes académicas

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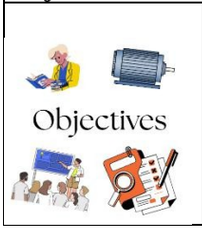
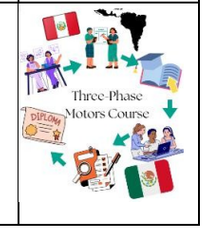
Abstract

The project aims to strengthen the learning and application of the operation and efficiency of three-phase induction motors in industrial systems through the implementation of a collaborative Mirror Course between the Autonomous University of Nuevo León [Mexico] and César Vallejo University [Peru]. Based on the COIL [Collaborative Online International Learning] methodology, an international course was designed that integrates theory, practice, and collaborative work in digital environments. The content includes equivalent circuit analysis, no-load and locked rotor tests, energy efficiency, and applied problem solving. The strategy was developed through collaboration between academic bodies specializing in teaching and research, ensuring a comprehensive and up-to-date approach. The expected results include the strengthening of technical skills, intercultural teamwork, and the use of digital technologies, contributing to the internationalization of the curriculum and the preparation of engineers capable of facing the challenges of Industry 4.0.

Objective	Methodology	Contribution
		

COIL, Three-phase induction motors, Energy efficiency

Green taxes and differentiated fiscal policy for MSMES in Hidalgo: Gaps, challenges, and opportunities for a sustainable transition

Impuestos verdes y política fiscal diferenciada para las MIPYMES en Hidalgo: Brechas, desafíos y oportunidades para una transición sostenible

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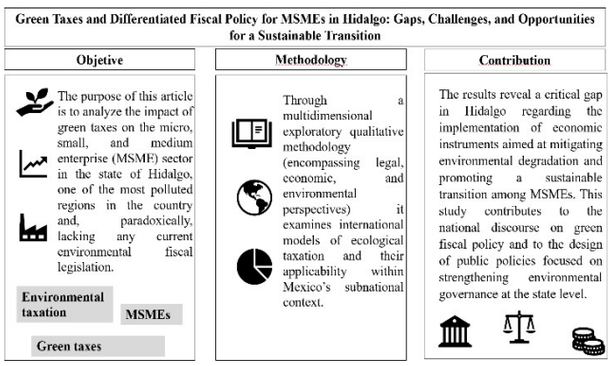
Abstract

The purpose of this article is to analyze the impact of green taxes on the micro, small, and medium enterprise [MSME] sector in the state of Hidalgo, one of the most polluted regions in the country and, paradoxically, lacking any current environmental fiscal legislation. Through a multidimensional exploratory qualitative methodology [encompassing legal, economic, and environmental perspectives] it examines international models of ecological taxation and their applicability within Mexico's subnational context. The results reveal a critical gap in Hidalgo regarding the implementation of economic instruments aimed at mitigating environmental degradation and promoting a sustainable transition among MSMEs. This study contributes to the national discourse on green fiscal policy and to the design of public policies focused on strengthening environmental governance at the state level.



Environmental taxation, Green taxes, MSMEs

Training for SMEs in the Tourism Sector as a tool to contribute to growth in San Martín Texmelucan, Puebla

Capacitación a MyPes del Sector Turismo, como herramienta para coadyuvar al crecimiento en la Región de San Martín Texmelucan, Puebla

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Abstract

This article analyzes the impact of training on micro and small enterprises [MSEs] in the tourism sector as a strategic tool to foster economic growth in the San Martín Texmelucan region, Puebla. Using a quantitative approach, the main training needs of tourism entrepreneurs were identified, and the effect of training programs in key areas such as customer service, digital marketing, and administrative management was evaluated. The results show that training strengthens the operational and competitive capacities of MSEs, improves service quality, and promotes greater integration with other actors in the sector. It is concluded that investing in specialized training is essential to boost regional tourism activity, generate employment, and consolidate San Martín Texmelucan as an destination in the state of Puebla.

Business training, Competitiveness, Tourism SMEs

Financial education as a determining factor in entrepreneurship and innovation strategies: ITSSMT Case

La educación financiera como factor determinante en las estrategias de emprendimiento e innovación: Caso ITSSMT

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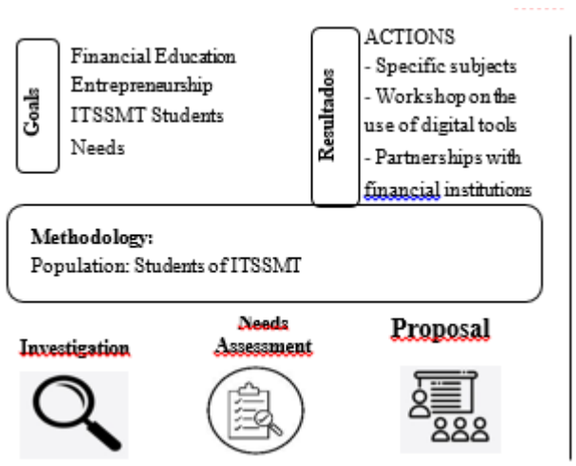
Abstract

Financial education is essential for the development of entrepreneurial and innovative projects, as it enables students and future professionals to acquire tools for managing resources, assessing risks, and designing sustainable strategies. This article analyzes the importance of financial education as a determining factor in the development of entrepreneurial initiatives, using the Instituto Tecnológico Superior de San Martín Texmelucan [ITSSMT] as a case study.



Financial Education, Entrepreneurship, Training

Resource optimization through the use of fiscal, financial, and administrative control strategies in SMEs

Optimización de recursos mediante el uso de estrategias fiscales, financieras y de control administrativo en PyMes

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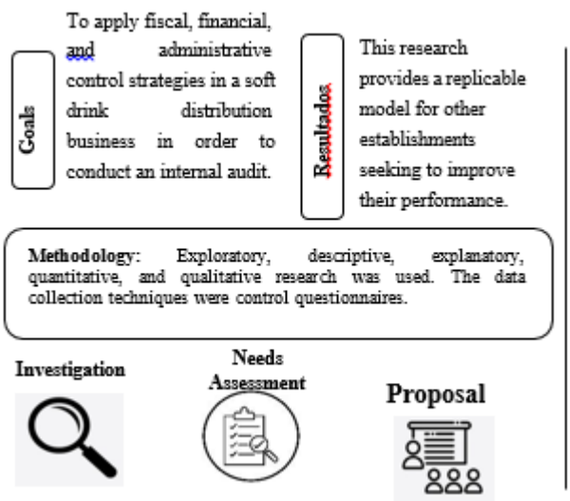
María Elena, Hernández-Hernández / O-8193-2018 0000-0001-7172-3802 927536

Abstract

The Optimization of Resources through the use of fiscal, financial, and Administrative Control Strategies in SMEs has the General Objective of applying fiscal, financial, and administrative control strategies in a beverage distribution business in order to conduct an internal audit. Exploratory, descriptive, explanatory, quantitative, and qualitative research was used. The data collection techniques were control questionnaires. This research offers a replicable model for other establishments seeking to improve their performance.



Tax strategies, Optimization and SMEs

Collaborative digital platforms to strengthen institutional communication in technological higher education: Case of Instituto Tecnológico de Lázaro Cárdenas

Plataformas digitales colaborativas para fortalecer la comunicación institucional en educación superior tecnológica: Caso Instituto Tecnológico de Lázaro Cárdena

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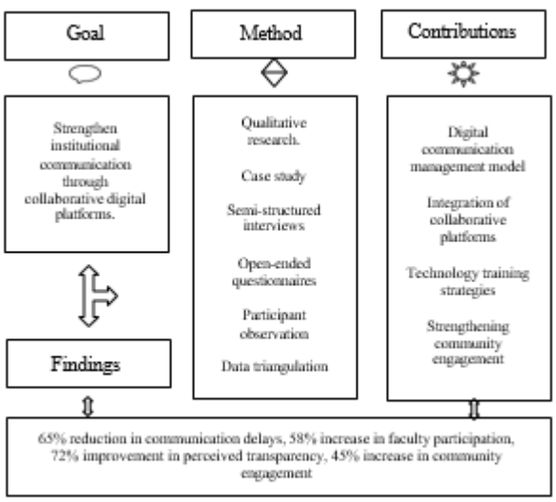
Abstract

Institutional communication constitutes a strategic axis for educational management in technological higher education institutions. This study addresses the problem of insufficient and ineffective communication channels at the Technological Institute of Lázaro Cárdenas [ITLAC], which generate administrative delays, information duplication, and low community participation. Through qualitative case study research, a participatory diagnosis was conducted using semi-structured interviews, open questionnaires, and participant observation with an intentional sample of 50 educational actors [teachers, administrators, students, parents, and community representatives]. Findings reveal that 67% of teachers present limited use of digital technologies, 72% perceived disconnection with local actors, and absence of integrated academic management systems. In response, a management model based on collaborative digital platforms was designed and implemented to centralize institutional information, optimize administrative processes, and promote co-responsible participation. Results demonstrate significant improvements in communicative efficiency, organizational transparency, and community cohesion, constituting a replicable model for institutions of the National Technological Institute of Mexico.



Institutional Communication, Digital Transformation, Collaborative Digital Platforms

Balanced scorecard applied to a High School

Cuadro de mando integral aplicado a un centro escolar de Educación Media Superior

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Abstract

The Balanced Scorecard was designed following the McKinsey model, with the aim of implementing a systematic process involving the management, administrative, and teaching staff, comprised of a total of 47 participants [sample]. Thanks to this tool, the institutional planning model was improved, emphasizing both an internal and external analysis of the school context, while also considering the previously established vision, mission, and values. Strategic indicators related to revenue and profitability, as well as objectives, responsibilities, and measurement mechanisms, were defined. Although the research did not consider evaluating a full implementation period, the adoption of disciplined management was recommended to consolidate a culture of monitoring and measurement at the school. In the future, the BSC approach could be expanded to incorporate additional sectoral and financial indicators, with the aim of enabling the institution to achieve broader objectives.

Balanced Scorecard, Strategic Management, School

Innovation in total quality management: strategy for operational improvement in the real estate sector

Innovación en la gestión de calidad total: estrategia para la mejora operativa en el sector inmobiliario

Guillermo-Chuc, Giselle, Quijano-García, Román, Alcocer-Martínez, Fidel And Patron-Cortes, Roger Manuel

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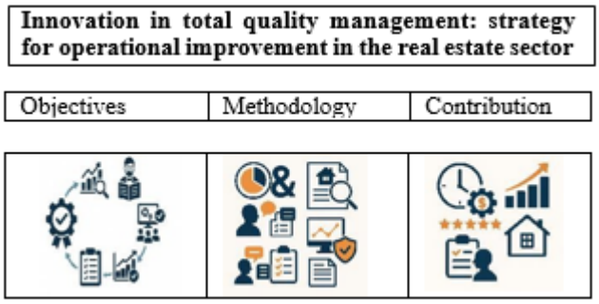
Abstract

The real estate sector faces growing challenges in competitiveness, customer satisfaction and sustainability. The objective of this study is to design a Total Quality Management Plan for a real estate company located in the Mexican southeast, in order to improve operational efficiency and customer satisfaction. To do this, quality standards and trends were reviewed, and a mixed methodology was applied that included interviews with managers, surveys of clients, employees and suppliers, in addition to the analysis of hypothetical data. The process was developed in three phases: diagnosis, design and implementation. The results show deficiencies in procedures, access to real-time information and customer service. It is concluded that a Total Quality model supported by emerging technologies strengthens operational efficiency, competitiveness and institutional reputation in the real estate sector.



Quality, Operational Efficiency and Real Estate Sector

Saving habits and personal finance: A study of Accounting and Business Administration Students at the Universidad Autónoma de Coahuila, 2025

Hábitos de ahorro y finanzas personales: Un estudio de caso de los estudiantes universitarios de la Facultad de Contaduría y Administración de la Universidad Autónoma de Coahuila, 2025

Zamarrón-Otzuca, Nathalia, Ortiz-Osuna, Mayra Yazmín, Aguilar-Sánchez, Ana María And De La Garza-Cienfuegos, Sandra Patricia

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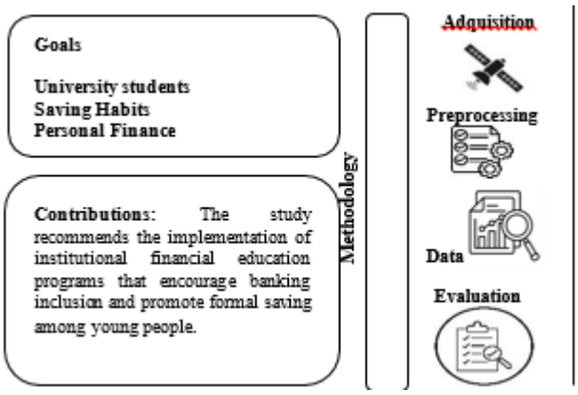
Abstract

This study aimed to analyze the impact of knowledge, habits, and socioeconomic factors on the personal finances of university students, with a focus on their saving practices. A quantitative, non-experimental, and cross-sectional method was employed. A structured survey, validated based on the ENSAFI [INEGI], was administered to a sample of 457 students from the Faculty of Accounting and Administration in Monclova, Coahuila. The findings reveal a predominance of informal saving, with 66.21% of students saving money at home. Only 29.48% possess a formal savings account, and a mere 13.83% have an Afore [retirement savings account]. Furthermore, 40.14% are unaware of the equivalence between their savings and their income, and 27.21% report having no savings at all. The main obstacles identified are limited income, low levels of banking inclusion, and insufficient financial literacy. The study recommends the implementation of institutional financial education programs that encourage banking inclusion and promote formal saving among young people.



Financial Habits, Personal Finance, Banking Inclusion

Learning analytics with CAD traces and predictive models: Reliability and performance

Analítica de aprendizaje con trazas CAD y modelos predictivos: Confiabilidad y desempeño

Corral-Verdugo, Alex, Sepúlveda-Romo, Adrián, Jimenez-Lopez, Eusebio And León-Rochin, German

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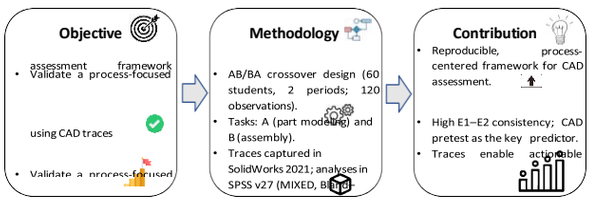
Abstract

This study gives us a proposal and validation of a trace-based evaluative framework for CAD courses in technical education. It integrates entry predictors (CAD pretest and spatial ability), process logs (operations, errors, undo actions, latencies and fully defined sketches), and rubric- based scoring to offer instruction-sensitive formative feedback. With 60 students under a crossed AB/BA design (120 observations), we estimated inter-rater reliability and predictive models. Consistency was high (α =.915; ICC = .849/.919) and there was no systematic bias between evaluations ($t(23) = -0.02$, p = .986; Bland–Altman). Performance was explained mainly by the CAD pretest, with additional contribution from spatial ability; E1 and E2 correlated strongly (r = .85). The study showed sequence-differential attrition (p = .006) which did not present selection bias. The study offers a replicable protocol and metrics that can be used by any instructor, promoting more efficient and equitable assessment decision-making.



CAD learning analytics, Process traces

Playful spaces, space for emotions

Espacios lúdicos, espacio de emociones

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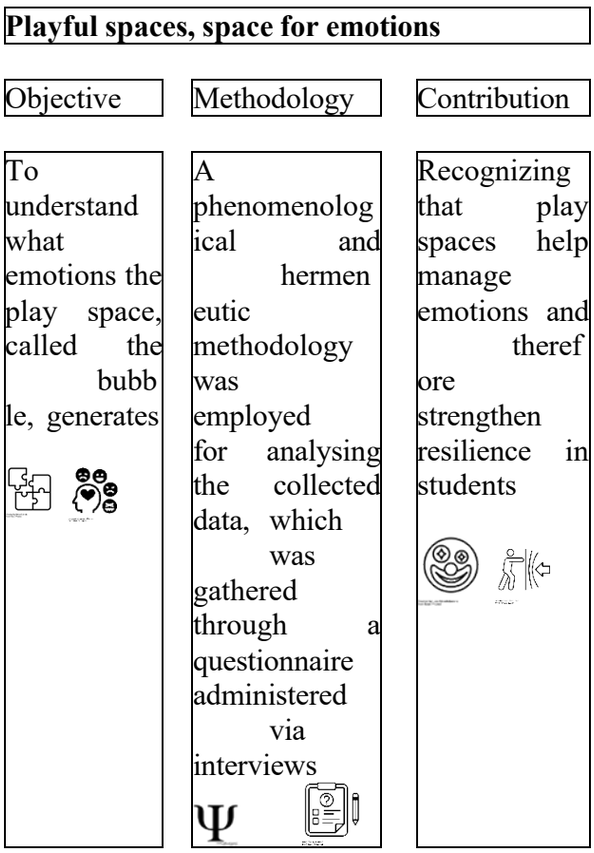
Abstract

This study unfolds through a pedagogical experience conducted in a space dedicated to playful activities, aiming to analyze the emotions generated by this space. The objective of this research is to understand the emotions evoked by the playful space, referred to as the "bubble." The space was conceived as a place that could help improve the students' social conditions and explore how play practices could contribute to emotional management and enhanced resilience. A phenomenological and hermeneutic methodology was employed for analyzing the collected data, which was gathered through a questionnaire administered via interviews. Preliminary results indicate that the students expressed emotions of joy, happiness, fun, and confidence.



Games, Playfull and emotions

The trajectory of SNII women at the San Martín Texmelucan Higher Technological Institute. The dispute over social reproduction work in the public and private spheres

La trayectoria de las mujeres SNII en Instituto Tecnológico Superior de San Martín Texmelucan. La disputa del trabajo de reproducción social en el espacio público y privado

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Abstract

This article presents an analysis of the trajectory of the women members of the SNII attached to the Instituto Tecnológico Superior de San Martín Texmelucan through a qualitative methodology with a feminist perspective with the aim of making visible the academic and scientific work they carry out within a Decentralized Higher Education Institution, which is characterized by particular nuances of hiring and structural organization that exacerbate the job insecurity and hiring instability that configures the public space of science and academia.

The trajectory of SNII women at the San Martín Texmelucan Higher Technological Institute. The dispute over social reproduction work in the public and private spheres.		
Objectives	Methodology	Contribution
Make visible the academic and Scientific work carried out by women members of the SNII in the face of the disputes they experience in private spaces.	Qualitative methodology, particularly critical narrative as a possible and coherent format with the theoretical foundations of feminisms	The disputes between academic and scientific work and the reproductive work carried out in the private sphere. The representation of women in the SNII of the ITSSMT

Researchers women, Academic Work, Social Reproduction

Business plan for the creation of a microenterprise producing habanero chili sauce in Villahermosa, Tabasco

Plan de negocio para la creación de una microempresa fabricante de salsa de chile habanero, en Villahermosa Tabasco

Morejón-Sánchez, Juana María, Notario-Priego, Ezequiel, Martinez-Izquierdo, Carlos Mario And Sierra-Morejon, José Luis

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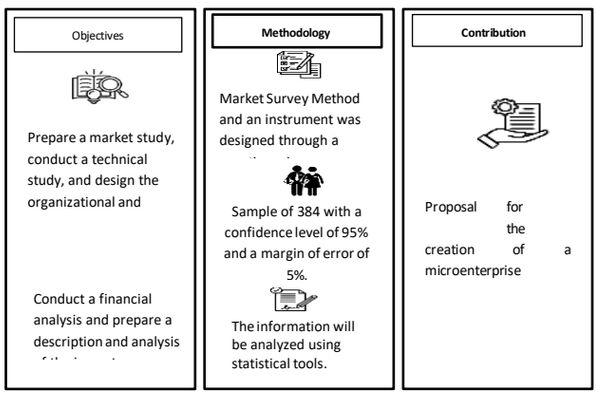
Abstract

The objective of this project is to develop a business plan proposal for the creation of a microenterprise that produces habanero pepper sauce in the city of Villahermosa, Tabasco. The methodology used will be a Market Survey technique, which includes a sample of 384 people. The results showed that this project supports Tabasco society by contributing to job creation and the utilization of a natural resource from a crop in the state of Tabasco.



Microenterprise, Production proces Organizational Chart

The importance of innovation in micro and small enterprises (MIPES) in León, Guanajuato, Mexico

La importancia de la innovación en las micro y pequeñas empresas MIPES de León, Guanajuato, México

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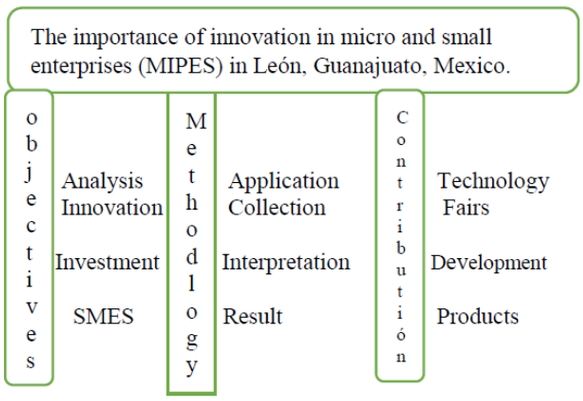
Kaczmarek-Chavarría, Marcela

Abstract

Innovation is very important for companies in general. After the pandemic, it became even more strategic for their operation and survival. This research aims to demonstrate the importance of innovation in micro and small enterprises (MIPES) and to answer the research question: Why analyze the importance of innovation in micro and small enterprises in León, Guanajuato, ¿Mexico? The methodology used is mixed; quantitative, with 429 surveys applied to obtain results and create graphs, and qualitative, because part of the grounded theory is contrasted with findings from other national and international studies. The results show that MIPES do make full use of innovation. It is concluded that investment in technology, training in organization management, and attending fairs and conferences increases their levels of innovation.



MSMEs, Innovation, Strategy

Participatory and solidary management for the implementation of a dried armored catfish fillet plant in fishing cooperatives of the municipality of Centro, Tabasco, Mexico

Gestión participativa y solidaria para la implementación de la secadora de filete de bagre armado en cooperativas pesqueras del municipio de Centro, Tabasco, México

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Karina, González-Izquierdo / LOQ-9398-2024 0009-0005-0769- 2868 1322306

Abstract

The article designs a participatory and solidarity-based management proposal to implement an armored catfish fillet dryer in cooperatives in the municipality of Centro, Tabasco, Mexico. Using a mixed-methods approach, it integrates surveys, interviews, observation, and SWOT analysis to diagnose gaps in governance, infrastructure, and market information. The model is grounded in the Social and Solidarity Economy and in commons governance principles, and it is operationalized in four phases: participatory diagnosis, stakeholder validation, collaborative formulation, and implementation with shared monitoring. Recommendations include sanitary standardization and traceability, as well as commercial linkages with fair pricing and the inclusion of women and youth, under cooperative identity and principles. The hypothesis is partially validated: the model improves organizational cohesion, operational efficiency, and socioeconomic conditions, and contributes to Sustainable Development Goals 8, 12, and 14, while strengthening local capacities in a sustainable manner.

Fisheries management, Community participation, Food processing

Diagnostic study of digital skills based on the DigComp 2.2 framework in a union of cooperatives in the state of Puebla, México

Estudio diagnóstico de competencias digitales basado en el marco DigComp 2.2 en una unión de cooperativas del estado de Puebla, México

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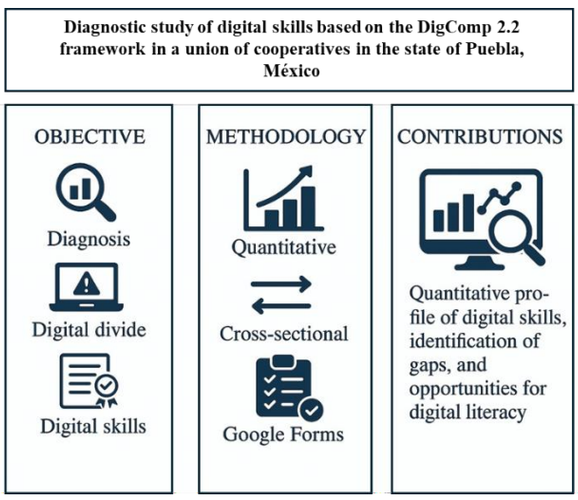
Abstract

The digital divide poses a central challenge to inclusion and development in the Social and Solidarity Economy (SSE), particularly impacting social cooperatives by limiting their access, innovation, and participation in the digital environment. Structural factors such as educational inequality, lack of infrastructure, and a lack of digital skills perpetuate this problem, especially in Mexico and Latin America. In response, this study diagnoses the level of digital skills in a cooperative union in Puebla, Mexico, using the DigComp 2.2 framework. The objective is to identify gaps in these skills to inform strategies that promote technological adoption, productivity, and greater integration into the digital ecosystem. The results provide a quantitative basis for designing and implementing targeted actions to reduce the digital divide in the cooperative sector, facilitating its sustainable development.



Digital skills, digital literacy, cooperatives, DigComp 2.2

Public spending and economic growth: evidence from a panel data model for Mexico's states, 2000–2023

Gasto público y crecimiento económico: evidencia desde un modelo de datos de panel para las entidades federativas de México, 2000–2023

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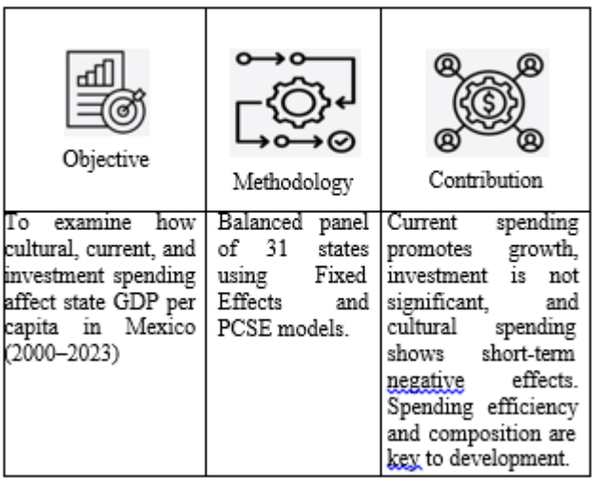
Abstract

This article analyzes the relationship between public spending and economic growth in Mexico at the state level during the period 2000– 2023. Based on a balanced panel of 31 states, an econometric model is estimated that incorporates cultural spending, current spending, and public investment per capita as explanatory variables of state gross domestic product per capita. The methodological strategy combines fixed and random effects estimates, diagnostic tests, and corrections using Panel Corrected Standard Errors [PCSE] to address problems of heteroscedasticity and autocorrelation. The results show that current expenditure has a positive effect on state economic growth, while public investment does not have a robust impact and cultural expenditure has a negative impact in the short term. These findings are the key determinants of economic performance, with relevant implications for budget planning and fiscal sustainability in Mexico.



Public spending, Economic growth, Panel data

Virtual reality for inclusion in community health

Realidad virtual para la inclusión en salud comunitaria

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Abstract

Design of a virtual tour as a tool for inclusion in community healthcare, developed for the Comprehensive University Clinic of UNEVT, within the framework of the TIAPYC Node. The proposal integrates technological innovation and territorial relevance through the use of 360° photography, institutional narrative, and accessibility strategies. The study is based on the recognition of inequalities in access to healthcare services in rural areas of the State of Mexico and draws on concepts such as digital literacy and emerging technologies with an educational focus. It also considers previous experiences with the use of virtual reality in clinical settings, although the present case has not yet been evaluated with users. Furthermore, the importance of technology transfer models with social impact is discussed. The virtual tour is projected as a replicable tool that strengthens the relationship between the university and the community and promotes digital and territorial inclusion.

Virtual Reality, Technology Transfer, Community Health

Administrative audit of a retail automotive sales company in the state of Veracruz

Auditoria administrativa a una empresa de comercialización del Sector Automotor Menor en el Estado de Veracruz

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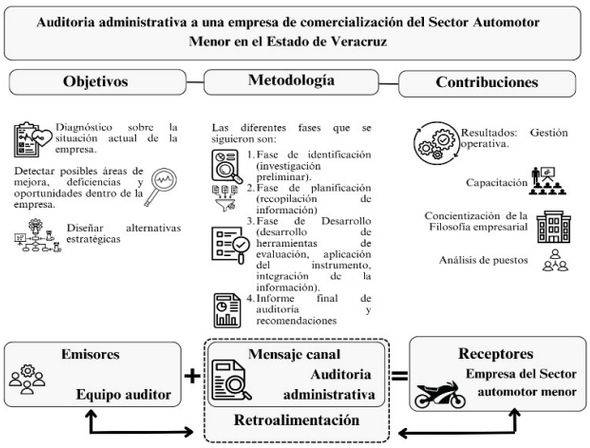
Dionicio, Parra-Valis / KEJ-2833-2024 0009-0006-1857-096X 543521

Álvaro, Díaz-Azamar / KEJ-1205-2024 0009-0003-8389-1311 436093

Abstract

The main purpose of this research was to conduct an administrative audit of a small automotive marketing company in the state of Veracruz. The objective was to evaluate the efficiency, effectiveness, and regulatory compliance of its internal processes. This was a field, descriptive, and documentary research project, using instruments and interviews with the Management, Sales, and Banking departments, on the management of its administrative processes. The results showed that employees need to be made aware of the company's philosophy, strategies implemented to achieve objectives, employee motivation is lacking, communication is improved, and management supervision and monitoring are implemented to ensure proper operation. The areas present functional management, and although they have administrative processes, they are not fully executed adequately. Therefore, staff training is recommended to achieve greater levels of efficiency and strategic alignment within the company.



Administrative, Deficiencies, Development

6 Agricultural Sciences and Biotechnology

Retrospective analysis of maize breeding for the humid tropic in México

Análisis retrospectivo del mejoramiento genético de maíz para el trópico húmedo de México

Sierra-Macias, Mauro, Ríos-Isidro, Clara, Gómez-Montiel, Noel Orlando And Barrón-Freyre, Sabel

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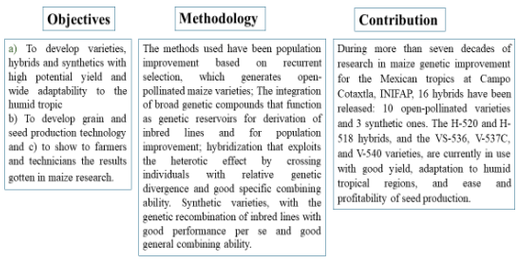
Abstract

During more than seven decades of research in genetic improvement of maize for the Mexican tropics at Campo Cotaxtla [INIFAP], 16 hybrids have been released: 10 open-pollinated varieties and 3 synthetic ones. The methods used have been population improvement based on recurrent selection, which generates open-pollinated varieties; The integration of broad genetic compounds that function as genetic reservoirs for the derivation of inbred lines and for population improvement; hybridization that exploits the heterotic effect by crossing individuals with relative genetic divergence and good specific combining ability. Synthetic varieties, with genetic recombination of inbred lines with good performance per se and good general combining ability. The H-520 and H-518 hybrids, and the VS-536, V-537C, and V-540 varieties, are currently in use with good yield, adaptation to humid tropical regions, and ease and profitability of seed production.



Hybridization, Population Improvement, Synthetics

Correlation between foliar analysis parameters and the normalized difference vegetation index [NDVI] derived from satellite images in avocado cultivation in the Salvador Escalante region of Michoacán, Mexico

Correlación entre los parámetros de análisis foliares y el índice de vegetación de diferencia normalizada [NDVI] derivado de imágenes satelitales en el cultivo de aguacate en la región de Salvador Escalante en Michoacán, Mexico

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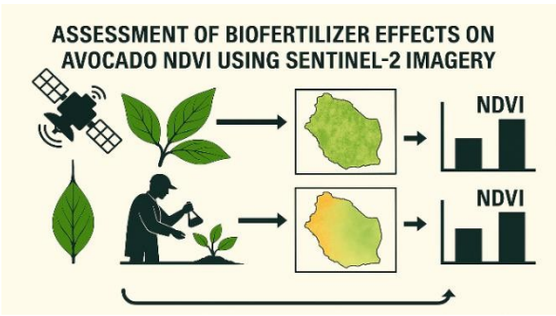
Abstract

This study addresses the correlation between foliar analyses and the Normalized Difference Vegetation Index [NDVI], derived from satellite imagery, in avocado cultivation across the municipalities of Tacámbaro, Acuitzio, and Salvador Escalante in Michoacán, Mexico. It examines how the application of biofertilizers influences nutrient levels in both soil and leaves, as well as NDVI values. The research compares field and laboratory data with satellite information to assess the effectiveness of remote sensing methods in monitoring crop nutrition. Although satellite-derived NDVI demonstrated limitations in its direct correlation with soil nutrition, the paper suggests that higher-resolution imagery and improved processing techniques could provide a more accurate tool for agricultural management. The economic importance of avocado production in Mexico, along with the need to optimize its cultivation, drives the search for more efficient and less invasive alternatives for nutritional diagnostics.



Avocado, NVDI, Foliar analysis

Effect of seaweed extract on the germination of seed corn [Zea mays L.]

Efecto del extracto de algas en la germinación de maíz [Zea mays L.]

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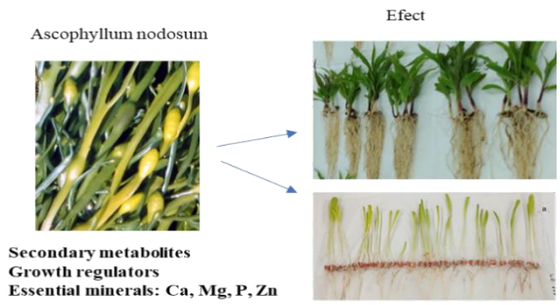
Abstract

Seaweeds, unicellular free-living organisms in aquatic and saline environments, can produce secondary metabolites that help combat phytopathogenic organisms, as well as growth regulators and essential minerals [calcium, magnesium, phosphorus, zinc]. Seaweed extract-based products have been reported as germination stimulants in various agricultural crops. The efficiency of a Ascophyllum nodosum extract on the germination of white hybrid and western purple maize, seeds was evaluated. A positive effect on seedling development was observed, significantly increasing biomass and stimulating cell elongation and vigor. Significant differences were found between genotypes, with western purple maize showing a marked increase in vigor and an elongation of the plumule of up to 5 cm.



Seaweed extract, *Ascophyllum nodosum,* Maize germination

Competitiveness of Mexican avocado exports to the United States based on external macroeconomic variables: a multiple linear regression approach for the period 2012–2024

Competitividad de las exportaciones de aguacate Mexicano a Estados Unidos en función de variables macroeconómicas externas: un enfoque de regresión lineal múltiple en el periodo 2012 – 2024

Hernández-Salas, José Esteban, Ortega-Montes, Fabiola Iveth, Macías-López, María Guadalupe And Domínguez-Acosta, Héctor Hugo

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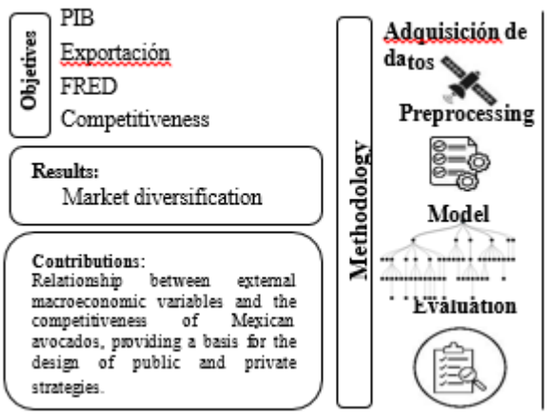
Abstract

Mexican avocado has become one of the most important agro-export products worldwide, with the United States as its main destination market. However, this high concentration exposes exports to the volatility of external macroeconomic factors. This article analyzes the impact of the U.S. Gross Domestic Product [GDP], Federal Reserve interest rate, U.S. inflation, and the peso–dollar exchange rate on the competitiveness of Mexican avocado exports during 2010–2024. Using a multiple linear regression model in SPSS, results show that U.S. GDP and exchange rate have a positive effect on exports, while interest rates and inflation exert negative pressures. Findings highlight the importance of market diversification and financial hedging to reduce risks derived from international economic conditions.



Mexican avocado, agricultural exports, U.S. GDP, inflation, exchange rate, multiple linear regression

Environmental impact of wastewater discharges containing surfactants and their effect on biomass in anaerobic reactors during treatment

Impacto ambiental por descargas de aguas residuales con tensoactivos y su efecto en la biomasa de reactores anaerobios durante su tratamiento

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Abstract

The widespread use of surfactants in domestic, industrial, and agricultural products has sparked growing concern due to their environmental persistence and potential for bioaccumulation in living organisms. The results showed that the biomass from the acidogenic reactor was able to eliminate this pollutant in terms of its COD (mg/L) by 42.24% and surfactant biodegradation at a concentration of 200 mg/L by 86.65% (experiment V), with a simultaneous desorption and biodegradation dynamic of 39.38 mg/day. At 300 mg/L (experiment VI), these values decreased to 36.6% and 55%, respectively. The methanogenic reactor fed with the effluent from this reactor showed a COD removal and LAS biodegradation efficiency of 83.17% and 13.85% with a bioaccumulation rate of 30.18 mg/day (experiment III). While at a LAS concentration of 300±0.05 mg/L (experiment VI), the LAS accumulation trend in the biomass of both reactors was 29.41 mg/d and 21.07 mg/d.

Environmental Impact, Bioaccumulation, Ecosystems, Biodiversity, Anaerobic Reactor, Surfactants

Genotype environmental interaction in prospect maize [Zea mays L.] hybrids and varieties for the humid tropic in México

Interacción genotipo ambiente en híbridos y variedades de maíz [Zea mays L.] prospectos para el trópico húmedo de México

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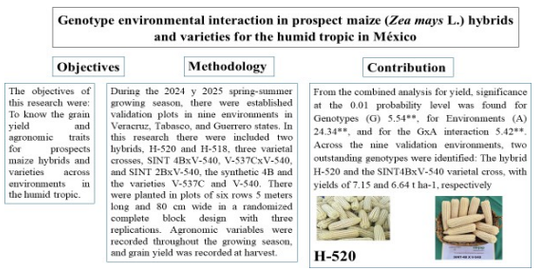
Abstract

With the objectives of knowing the grain yield and agronomic traits for prospects maize hybrids and varieties in the humid tropic, during the 2024 y 2025 spring-summer growing season, there were established validation plots in nine environments in Veracruz, Tabasco, and Guerrero states. In this research there were included two hybrids, H-520 and H-518, three varietal crosses, SINT 4BxV-540, V-537CxV-540, and SINT 2BxV-540, the synthetic 4B and the varieties V-537C and V-540. There were planted in plots of six rows 5 meters long and 80 cm wide in a randomized complete block design with three replications. Agronomic variables were recorded throughout the growing season, and grain yield was recorded at harvest. From the combined analysis for yield, significance at the 0.01 probability level was found for Genotypes [G] 5.54**, for Environments [E] 24.34**, and for the GxE interaction 5.42**. Across the nine validation environments, two outstanding genotypes were identified: The hybrid H- 520 and the SINT4BxV-540 varietal cross, with yields of 7.15 and 6.64 t ha-1, respectively.



Heterosis, Seed, Zea mays L humid tropic

Utilization of geothermal energy as a sustainable energy source for greenhouses in south-central Chihuahua State, Mexico

Aprovechamiento de la energía geotérmica como fuente energética sostenible para invernaderos en el centro-sur del estado de Chihuahua, México

Álvarez-Avilés, Ángel G., Cortez-Cortez, Alejandro, Aguirre-Orozco, Mario A And Baray-Guerrero, Maria Del Rosario

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Abstract

The main objective of this study was to assess the geothermal energy potential as a sustainable alternative for heating greenhouse systems in the south-central region of Chihuahua, Mexico. To achieve this, I carried out fieldwork at various thermal springs in the area, recording essential physical parameters such as water temperature, flow rate, and other site-specific characteristics relevant to thermal energy evaluation. At each location, water samples were collected and subjected to laboratory-based physicochemical analysis, which provided insights into the mineral content and thermal behavior of the geothermal fluids. These results were used to estimate the available thermal energy, expressed in barrels of oil equivalent, and subsequently, an economic assessment was conducted to determine its approximate market value in U.S. dollars using current hydrocarbon price benchmarks. Additionally, I projected the total surface area of greenhouses— measured in square meters—that could potentially be heated using this energy, considering the thermal demands of protected crops commonly grown under controlled conditions in the region. One key limitation identified was the localized nature of geothermal resources, which could present challenges for large-scale deployment. However, the implications are noteworthy. The findings confirm the viability of utilizing low-enthalpy geothermal sources for agricultural heating applications. Beyond the technical and economic feasibility, this approach offers environmental advantages by promoting cleaner energy use, reducing dependence on fossil fuels, and enhancing the sustainability of agricultural practices. In conclusion, the study supports the integration of geothermal energy as a practical and eco-friendly solution for greenhouse heating in semi-arid regions.

Objectives	Methodology	Contribution
To evaluate the energy potential of geothermal origin as a sustainable alternative for heating greenhouses in the central-southern area of the state of Chihuahua, Mexico	Fieldwork was carried out at various thermal springs in the region, where fundamental parameters such as water temperature and Flow rate were recorded.	hey demonstrate the technical an d economic viability of using low-enthalpy geothermal resources in the agricultural sector

Geothermal energy, Alternative energy, Greenhouses, Agricultural heating

7 Engineering

Design of an experimental reactor for the selective and efficient recovery of lithium from waste battery cathode leaching processes

Diseño de un reactor experimental para la recuperación selectiva y eficiente del litio a partir de procesos de lixiviación de cátodos de baterías de desecho

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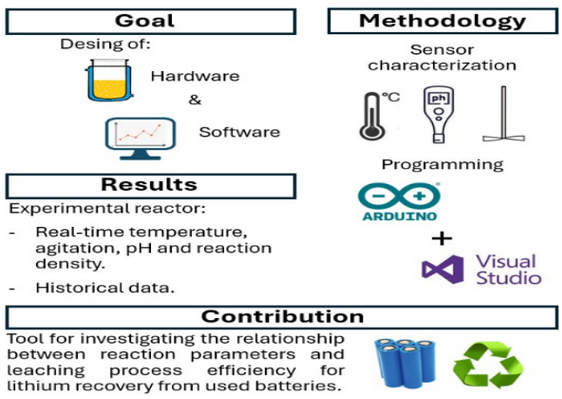
Abstract

This paper presents the design of an experimental reactor based on hardware and software, which monitors the reaction parameters of leaching processes for the recovery of lithium from waste battery cathodes. The hardware consists of a 250 ml double-layer reaction bottle, a magnetic stirring controller, and an Arduino-based system for measuring the temperature and pH of the reaction. The measured data is fed into the software, where it is processed to determine reaction parameter profiles. The experimental reactor will fulfill its purpose by correlating the selective lithium recovery efficiency with the different reaction profiles carried out, which will allow the identification of key variables, the establishment of mathematical models that describe the behavior of the reaction, and the determination of the conditions that improve the efficiency of the process.



Reactor, Leaching, Lithium, Efficiency, Hardware, Software

Evaluation of environmental impact manifestations of electric power transmission projects

Evaluación de las manifestaciones de impacto ambiental de proyectos de transmisión de energía eléctrica

Aguilar-Marin, Jorge Luis, Cisneros-Villalobos, Luis, Vera-Dimas, José Gerardo And Gutiérrez-Álvarez, Yair Alejandro

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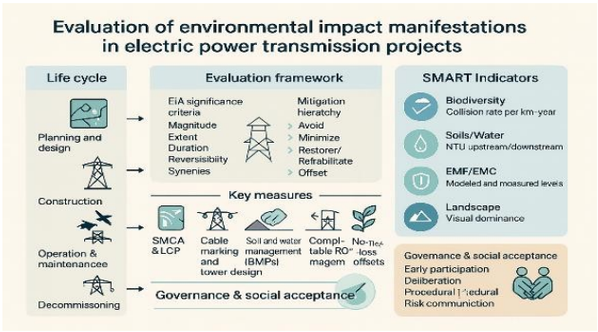
Abstract

The environmental impact of electrical transmission lines and substations is analyzed throughout their life cycle, from planning to decommissioning. Evaluation criteria and mitigation hierarchies are addressed, enabling cost-effective and socially legitimate decisions, integrating Environmental Impact Assessment [EIA] frameworks, valuation, and risk analysis. The approach includes the participation of project teams, local stakeholders, and life cycle considerations, with an emphasis on climate footprint and electrical losses. In addition, practical guidelines are proposed on aspects such as biodiversity, landscape, soil, water, and electromagnetic compatibility, promoting more robust EIAs for projects in contexts of accelerated energy transition.



Environmental impact assessment, Transmission lines, Biodiversity

Intelligent algorithm using convolutional neural networks for facial recognition of people with Autism Spectrum Disorder [ASD]

Algoritmo inteligente utilizando redes neuronales convolucionales para reconocimiento facial de personas con Trastorno del Espectro Autista [TEA]

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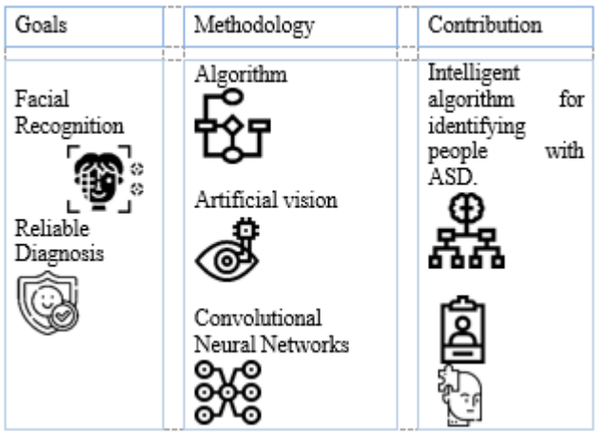
Abstract

This article describes the implementation of an algorithm for facial recognition in individuals with ASD. Computational technologies have advanced significantly, benefiting various sectors, including healthcare and education. In the case of ASD, computational techniques and intelligent algorithms can contribute to more accurate and earlier diagnosis, representing a key tool for healthcare professionals and society. Intelligent algorithms play a crucial role in automating complex processes, such as analyzing large volumes of data and making decisions in real time. Their ability to identify patterns and trends allows for more informed and accurate decisions. Therefore, implementing an intelligent algorithm for identifying individuals with ASD allows for more efficient, reliable, and accessible diagnosis.



Autism Spectrum Disorder, Facial recognition, Computer vision, Deep learning

Design of an integrated web system for document and administrative management of an agricultural center: a case study in San Rafael Ixtapaluca

Diseño de un sistema web integrado para la gestión documental y administrativa de un núcleo agrario: estudio de caso en San Rafael Ixtapaluca

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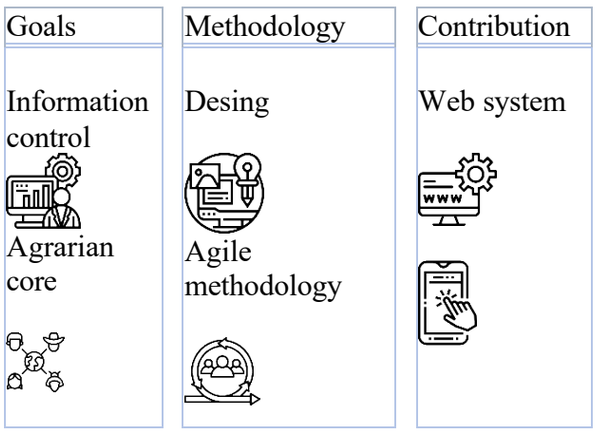
Abstract

This article presents the design of an integrated web-based system to optimize document and administrative management in an agrarian community. The research arose from the need to modernize ejido processes, traditionally managed manually, which generates inefficiencies, risks of document loss, and difficulties in accessing information. The study employs an agile development methodology, which includes gathering requirements through interviews with key stakeholders such as the ejido commissioner and ejidatarios. As a result, a technological architecture is proposed that includes the design of a relational database to ensure data integrity, user stories, and an intuitive user interface. The system integrates modules to manage the ejidatario registry, resources, legal documentation, and administrative activities, constituting a tool for transparency, efficiency, and decision-making in the agrarian community.



Agrarian core, Database, Interface design, Web system

EVALUATEC: learning analytics for decision-making

EVALUATEC: analítica de aprendizaje para la toma de decisiones

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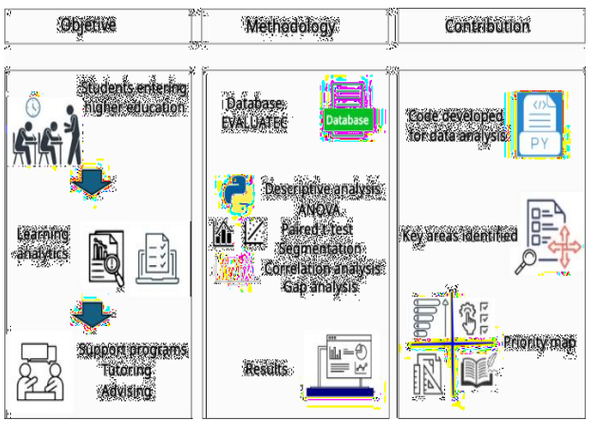
Abstract

Admission to technological higher education in Mexico faces the challenge of receiving students with heterogeneity in their academic preparation. For this reason, an analysis of the results of the EVALUATEC 2025 exam applied at the Technological Institute of Conkal is presented, using descriptive, comparative and correlational statistical techniques, complemented by segmentation tests by performance levels and gap analysis. The methodological innovation consisted of the use of digital learning analytics tools based on Python, to process data, generate tables and visualizations, and offer objective evidence for educational planning. The results show significant deficiencies in reading comprehension and mathematics, as well as a high concentration of students at low performance levels. This research is part of the TecNM's ICT research line, showing the integration of computational methods in institutional decision-making and the design of learning support strategies.



Learning analytics, New students, ICT analysis

Effect of electrode configuration on physicochemical parameters during textile dye degradation by plasma in an air-water system

Efecto de la configuración de electrodos sobre parámetros fisicoquímicos en la degradación de un colorante textil mediante plasma en un sistema aire-agua

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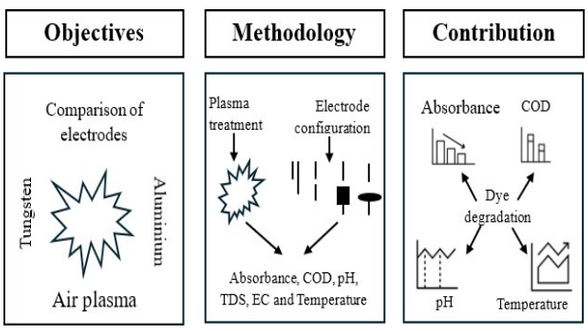
Abstract

The influence of electrode configuration on a plasma generation system operating at atmospheric pressure for the degradation of the commercial textile dye Dark Blue 628 in aqueous solution was investigated. The initial dye concentration was 1600 mg/L, and 350 mL of the solution was exposed to plasma treatments using four different electrode configurations [parallel point-to-point, opposing point-to-point, vertical point-to-surface, and horizontal point-to-surface] for 100 minutes. The plasma generation parameters were kept constant [5000 V, 50 mA]. Dye degradation was assessed using UV/VIS spectrophotometry [absorbance after plasma treatment and absorbance after plasma treatment and filtration], as well as chemical oxygen demand [COD], pH, electrical conductivity, total dissolved solids, and temperature. Dye degradation occurred with all electrode configurations, but was more significant, based on absorbance and COD values, for plasma treatments using tungsten-aluminium combined electrodes.



Electrodes, Plasma, Degradation

Surface modification of ceramic substrates obtained by additive manufacturing for possible use in photocatalytic applications

Modificación de la superficie de sustratos cerámicos obtenidos mediante fabricación aditiva para su posible uso en aplicaciones fotocatalíticas

Hernández-Hernández, Celia Massiel, Melo-Máximo, Lizbeth, Melo-Máximo, Dulce Viridiana And Vega-Morón, Roberto Carlos

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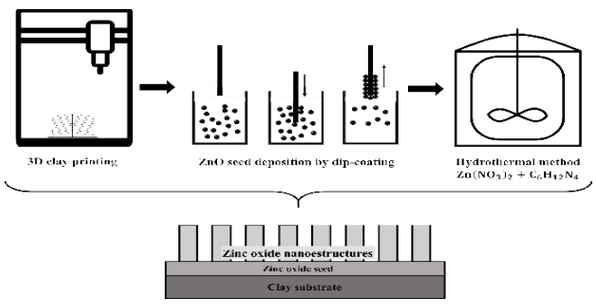
Abstract

The additive manufacturing revolution focuses on the use of intelligent technologies that enable the production of personalized objects. This work presents the 3D printing of air- drying moldable clay as a potential substrate for the support of zinc oxide [ZnO] nanoparticles. The process began with the printing of a 40 mm bucket of air-drying moldable clay; It was left to dry for 24 hours. A nanostructured zinc oxide seed was chemically synthesized and deposited by immersion on the clay substrate, then a growth of nanostructures was carried out by the hydrothermal method. The print showed definition in the layers, but small defects due to excess water; After the hydrothermal process, the exposed piece considerably reduced its size, however, the clay material has good affinity with zinc oxide nanostructures



Clay, Nanostructures, Zinc oxide

Mobile detection of strawberry plant diseases using MobileNetV3 and Kotlin

Detección móvil de enfermedades en plantas de fresa mediante MobileNetV3 y Kotlin

Rodríguez-Sandoval, Ever Essaú, Ochoa-Ornelas, Raquel And Rodríguez-González, Ansel Yoan

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Raquel, Ochoa-Ornelas / S-4687-2018 0000-0003-1824- 5789 668976

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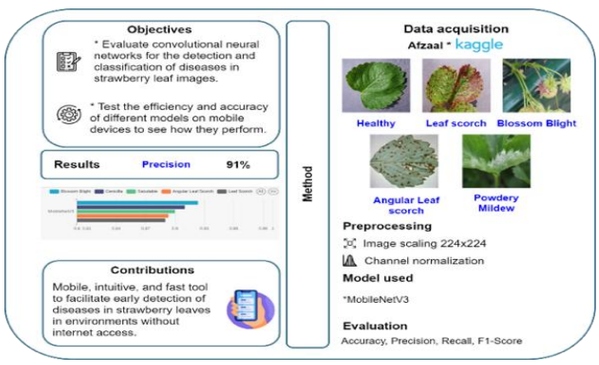
Abstract

The project develops an Android mobile application in Kotlin for the detection of diseases in strawberry plants using a MobileNetV3 model converted to TensorFlow Lite. It includes stages of dataset preprocessing, model fine-tuning, and on- device inference. The application, built with Jetpack Compose, integrates the camera to make real-time predictions without an internet connection. Experimental results and recent literature confirm that MobileNetV3 offers an effective balance between accuracy and efficiency, enabling agile performance on mobile devices. This approach demonstrates the potential of lightweight deep learning in digital agriculture, facilitating portable diagnostic tools for strawberry growers.



MobileNetV3, TensorFlow Lite, Kotlin, Strawberries plants

Thermal study of heat sink used in Peltier modules

Estudio térmico de disipadores usados en módulos de Peltier

Alvarado-Juárez, Roberto, Rivera-Hernández, David Antonio, Guzmán-Cortes, Jhonatan Alberto And Rodríguez-Brito, Diana Isabel

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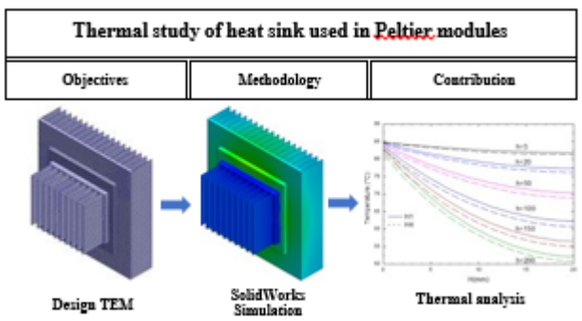
Abstract

This research reports the simulation done to a heat sink of a commercial TEM with a Peltier module. The analysis was done at the central fin for 4 cases of separation of the fins at the cold and hot side [p=5.08, 3.81, 2.54, 1.27 mm] and 6 cases of convective heat transfer [h=5, 20, 50, 100, 150 and 200 W/[m^2K]]. Results show that the thermal behavior is similar for each separation of fin without significant difference of temperature. The main differences were observed at the hot side were the case of p=1.27mm and h=200 W/[m^2K] is the best option to reduce the temperature of the heat sink in the hot side of a TEM.



Heat sink, Peltier element, Thermal analysis

Use of artificial intelligence in the development of information systems in it companies, benefits, and legal challenges: a Costa Rican perspective

Uso de inteligencia artificial en el desarrollo de sistemas de información en empresas de ti, beneficios y retos legales: una perspectiva Costarricense

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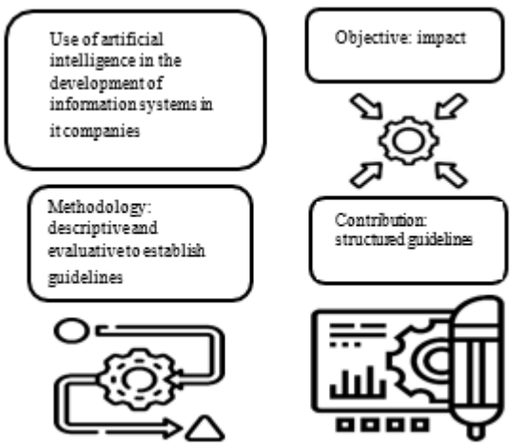
Abstract

The development and use of artificial intelligence [AI] in information systems has revolutionized the operational and strategic dynamics of companies in the technology sector. In Costa Rica, this phenomenon has impacted both the private and public sectors, generating significant advances in automation, efficiency, and decision-making. However, it has also brought with it ethical, legal, and other challenges that require a coordinated response from business management, internal policymaking, and government regulation. This article presents a comprehensive analysis of the use of artificial intelligence in the development of information systems in information technology [IT] companies in Costa Rica, considering its benefits, legal implications, and regulatory challenges.



Artificial Intelligence, Legal Implications, Ethics

Detection of body regions in thermal images using YOLOv11 for Industrial Ergonomics Evaluation

Detección de regiones corporales en imágenes térmicas utilizando YOLOv11 para la aplicación en evaluación ergonómica industrial

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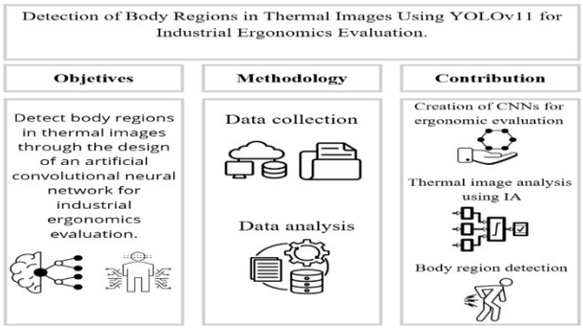
Abstract

This study presents the development of a computer vision model based on convolutional neural networks for detecting body regions in thermal images. A dataset of 500 images was collected using a HIKMicro thermal camera [240×320 pixels] and manually annotated through the Label- Studio platform. The detection task was performed using the YOLOv11 algorithm with a single category corresponding to the body region, trained for 10 epochs with a batch size of 16 and a learning rate of 0.01. The dataset was divided into 400 training, 50 validation, and 50 testing images. The proposed model achieved approximately 80% accuracy, as evaluated by a confusion matrix. Findings suggest that this approach can be effectively applied in industrial environments, particularly for optimizing ergonomic assessment processes in small and medium-sized enterprises and organizations within the social economy sector.



Ergonomic Evaluation, Thermal Images, Convolutional Neural Networks [CNNs]

Design of a drying process for quince [Cydonia oblonga] in a tray dryer, through the analysis of physicochemical parameters

Diseño de un proceso de secado de membrillo [Cydonia oblonga] en un secador de charolas, mediante el análisis de parámetros fisicoquímicos

Rendon-Sandoval, Leticia, Gutiérrez-Peña, Esteban, Vallejo-Sartorius, Irma And Llanillo-Navales, Jesús Gerardo

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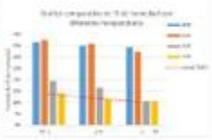
Abstract

This research aims to design a quince [Cydonia oblonga] drying process in a tray dryer, with the aim of determining optimal drying points, thus adding value to the region's fruits. Fick and Page mathematical models were applied to determine the optimal time and temperature for quince [Cydonia oblonga] drying. The drying process was evaluated at different temperatures [40, 50, 60, and 70°C] as a function of time. Optimal drying temperature parameters were also identified, considering the following variables: thickness, diameter, drying time, and humidity. Based on experimental tests and statistical analysis, it was observed that optimal operating conditions exist for tray drying and also for the preservation and proper consumption of quince. Currently, there is little research on quince [Cydonia oblonga] drying in Mexico, since different types of drying have been carried out in Argentina and Peru, such as osmosis dehydration and solar drying. Keywords: Drying, shelf life, temperature, quince.





Drying, Shelf Life, Temperature, Quince

Electrochemical corrosion of carbon steel in congenital water

Corrosión electroquímica del acero al carbono en agua congénita

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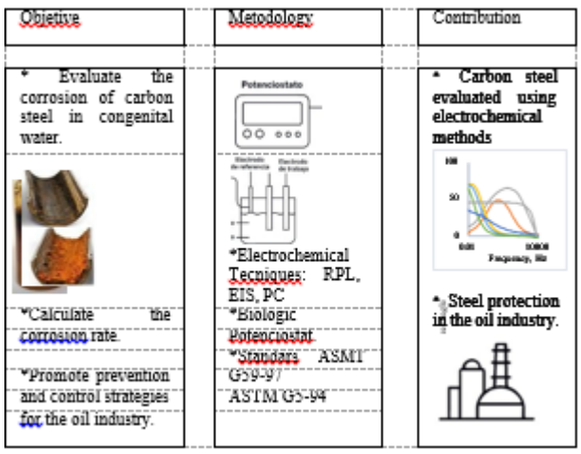
Abstract

The oil industry uses carbon steel in extraction and drilling equipment, transportation pipelines, and hydrocarbon storage tanks. Extracted oil and gas contains congenital water, which, due to it is characteristics, is an electrolyte capable of accelerating corrosion, seriously impacting the oil industry. The behavior of carbon steel with and without surface defects exposed to congenital water was studied using electrochemical techniques such as Linear Polarization Resistance [LPR], Potentiodynamic Polarization [PC] Curves, and Electrochemical Impedance Spectroscopy [EIS] on different days of exposure. According to the results, carbon steel without defects exhibits activation corrosion as exposure time progresses, forming corrosion products that adhere to and provide protection on the metal surface, while carbon steel with surface defects forms corrosion products with minimal protection.



Corrosión, Carbon Steel, Congenital Water

Modeling of the supply and consumption of the Huatusco Veracruz wáter network using SIMIO software

Modelación del abastecimiento y consumo de la red hídrica de Huatusco Veracruz con software SIMIO

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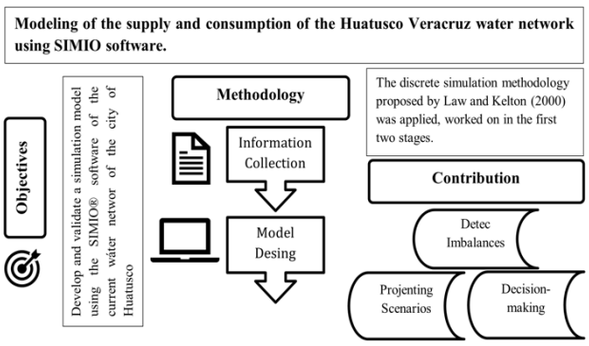
Abstract

The main objective of this article is to develop and validate a simulation model using SIMIO® software for the current water network in the city of Huatusco, Veracruz, in order to analyze its consumption and distribution for different sectors: domestic, urban, commercial, industrial, residential, and social interest. To this end, the discrete simulation methodology implemented by Law and Kelton was used, which included the characterization of the infrastructure, the collection of historical consumption data, and the construction of a model representing the supply cycles, with the purpose of evaluating usage patterns. Once the model was simulated, it was validated against the real system using a paired t-test. The result of this work is a statistically validated model that can serve as a support tool for decision-making in the city's water management, facilitating the projection of future scenarios and the detection of possible imbalances in distribution.



Simulation, Water Network, Distribution

Study to obtain Activated Carbon at the laboratory level of the bagasse of the Maguey Pitzometl (Agave marmorata) of Zapotitlán Salinas, Puebla

Estudio para obtención de Carbón Activado a nivel Laboratorio del bagazo del Maguey Pitzometl (Agave marmorata) de Zapotitlán Salinas, Puebla

López-Vigil, Miriam Silvia, Gómez-Flores, Nidia Esther, Santos-Alvarado, Héctor And Islas-Torres, Héctor

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Abstract

The Agave genus has a wide presence in Mexico, where approximately 75% of its total species are located, many of them endemic, as is the case of the Agave marmorata or Maguey Pitzometl, which is present in the Zapotitlán Salinas Puebla Region, which belongs to the Tehuacán-Cuicatlán Biosphere Reserve. Since pre- Hispanic times they have been used as a source of food, drink, construction, ornaments being part of the regional identity, history and culture. Currently, the growing demand for products distilled from Agave such as mezcal and tequila, have led to practices that threaten its natural regeneration. This activity generates large volumes of by-products such as bagasse, both from the maguey leaves that are removed to work only with the pineapple or center of the plant, and from the solid residue of said pineapple itself after subjecting it to the extraction process. The present work shows the results of the study to obtain Activated Carbon at the laboratory level of the bagasse of the Maguey Pitzometl (Agave marmorata) of Zapotitlán Salinas, Puebla as an alternative for the management and sustainable use of this by-product.

to obtain Activated Carbon at the laboratory level of the bagasse of the Maguey Pitzometl (Agave marmorata) of Zapotitlán Salinas, Puebla		
Objective	**Methodology**	**Conclusions**
To obtain Activated Charcoal from Maguey Pitzometl Bagasse from Zapotitlan Salinas Puebla at laboratory level 	Collection and cleaning of the maguey leaves of the Region under study, obtaining the bagasse, drying, carbonization, activation, washing, drying, grinding, characterization, packaging.	The bagasse of Maguey Pitzometl, which was previously characterized, is a good organic material for the production of activated carbon. Physical and chemical activation was applied using anhydrous potassium carbonate at two concentrations: 40% and 60%.

Bagasse, Activated Carbon, Endemic, By-product, Use

Artificial Intelligence in the Field of Ergonomics and Occupational Health for Risk Assessment

Inteligencia Artificial en el Ámbito de la Ergonomía y la Salud Ocupacional para la Evaluación de Riesgos

Muñoz-Hernandez, Raquel And Rangel-Lara, Saúl

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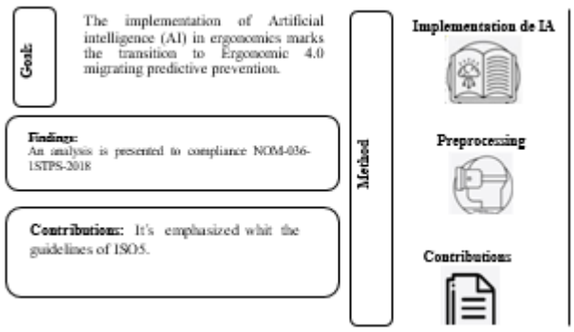
Abstract

Ergonomics marks the transition to Ergonomics 4.0, migrating from manual assessment to data-driven predictive prevention, primarily through Computer Vision (CV) and Machine Learning (ML), to objectify risk assessment, quantify biomechanical exposure in real time, and transform the effectiveness of training programs. An analysis is presented to automate compliance with NOM-036-1-STPS-2018, especially regarding the rigorous application of the NIOSH Revised Equation for a dynamic and continuous Level of Precaution (LPR). Through business case studies (Logistics, Manufacturing, and Corporate Wellness), the effectiveness of on-site monitoring and immediate feedback (Just-in-Time Learning) is demonstrated. It is emphasized that this application is consistent with the guidelines of ISO 11228 and ISO 9241, ensuring global harmonization of practices.



Artificial Intelligence, Ergonomics, Risk

Methodology for the Proposal of a Technological Package Development in Hydrocarbon Production Facilities

Metodología para propuesta de elaboración de paquete tecnológico en instalaciones de producción de hidrocarburos

Mendoza-Espinoza, Héctor Eduardo, Escorza-Sánchez, Yolanda Marysol And Marquez-López, Ángel De Jesús

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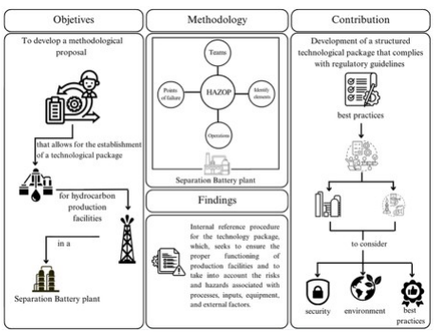
Ángel De Jesús, Marquez-López / OPN-8617-2025 0009-0005-3873-1030 2186476

Abstract

Objective: To develop a methodological proposal that allows for the establishment of a technological package for hydrocarbon production facilities in a Separation Battery plant. Method: The Hazard Analysis and Operational Methodology (HAZOP) is used in the development of the project, as it is a widely known and used methodology in the oil industry. Findings: The investigation into the operational context allows for the identification of the organization, the regulatory framework, the standards applicable to the sector, and the identification of good practices. This allows for the subsequent targeting of processes and subprocesses for information analysis and the subsequent establishment of an information matrix, allowing for the structuring of a proposal. Contributions: The proposal aims to contribute to the development of a structured technological package that complies with regulatory guidelines and guarantees proper operation in oil production facilities, providing a more complete understanding of the associated hazards and risk management.



Methodology, technology package, security

Sequential prediction of pediatric glucose dynamics using LSTM Networks Trained on Synthetic Physiological Data

Predicción secuencial de la dinámica glucémica pediátrica usando Redes LSTM entrenadas con Datos Fisiológicos Sintéticos

Sandoval-Vázquez, Olaf Gustavo, Ochoa-Ornelas, Raquel, García-Rodríguez, Julio Alberto And Gudiño-Ochoa, Alberto

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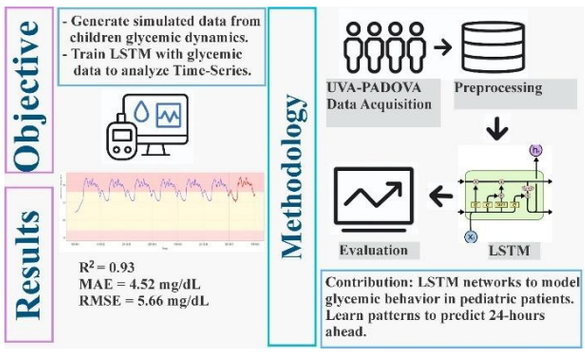
Abstract

This study evaluates a Long Short-Term Memory [LSTM] network-based architecture for sequential prediction of glucose levels in pediatric patients with Type 1 Diabetes Mellitus [T1DM] using synthetic data generated by a physiological simulator. The model is trained on multivariate time series, and its performance is evaluated using metrics. The overall results of R^2 of 0.93, MAE of 4.52 mg/dL, and RMSE of 5.66 mg/dL indicate that LSTM networks are able to effectively capture and reproduce pediatric glycemic dynamics from simulated historical data, demonstrating its potential for predictive applications in T1DM management.



LSTM, Type 1 Diabetes Mellitus, Synthetic Data, Time Series

Design of flush toilets using local materials in vulnerable areas of Altamira, Tamaulipas

Diseño de letrinas con arrastre hidráulico utilizando materiales locales en zonas vulnerables de Altamira, Tamaulipas

Martínez-Flores, Hilario Rafael, Alarcón-Ruiz, Erika, Zamudio-Aguilar, Minerva Ana María And Ordóñez-Pacheco, Luis Daniel

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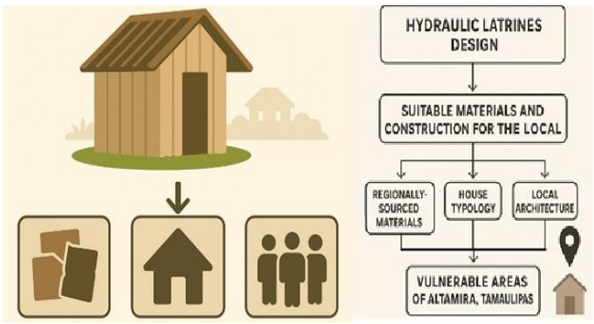
Abstract

This research paper presents the design of hydraulically flushed latrines that use local materials for the construction of the huts, ensuring that the sanitation system blends harmoniously with the physical and cultural environment of rural or peri-urban communities. Based on the premise that user acceptance increases when sanitation solutions respect the building typology, local resources, and social customs, we propose a technically, environmentally, and socioculturally viable model that promotes sustainability and improved basic sanitation conditions.



Sanitation, Latrine, Vulnerable Areas, Local Materials

[Title in TNRoman and B{++old No. 14 in English and Spanish]

Surname, Name 1st Author*[a], Surname, Name 1st Co-author[b], Surname, Name 2nd Co-author[c] and Surname, Name 3rd Co-author[d] [No.12 TNRoman]

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Abstract [In English]

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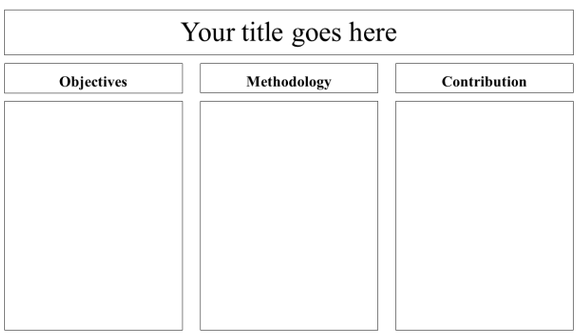

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Abstract [In Spanish]

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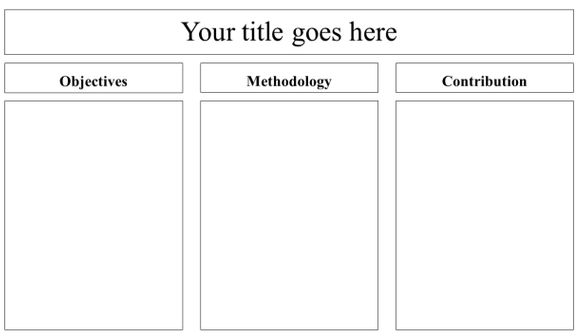

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