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# 10<sup>th</sup> Interdisciplinary Congress of Academic Corps

Universidad Tecnológica del Suroeste de Guanajuato

September 01, 2023.

## Preface

The Technological University of Southwestern Guanajuato and its chapters of Agricultural Sciences, Natural and Exact Sciences, Engineering and Technology Sciences, Education, Social and Administrative Sciences, Experiences in the Formation of Academic Corps and Networks Administrative Sciences, Experiences in the Formation of Academic Corps and Networks, CICA 2023. Thus, the CICA's general objective is to create a forum for academics and researchers from different countries to present and discuss different countries to present and discuss results and proposals in relation to the thematic areas of the congress, promoting and strengthening and strengthening the dissemination of research and technological development of the collegiate and academic research groups and/or and academic research groups and/or academic corps of higher education institutions, from a global perspective higher education institutions, from a global perspective. This volume X-2023 contains 117 refereed refereed that deal with these issues in Agricultural Sciences, Natural and Exact Sciences, Engineering and Technological Sciences, Education, Social and Administrative Sciences, Experiences in the Formation of Academic and Networks, chosen from among the contributions, we gathered some researchers and graduate students, researchers and researchers and graduate students, from 32 states of Mexico. We would like to thank the anonymous reviewers for their reports and many others who contributed greatly to the publication in these proceedings by reviewing the manuscripts. In these proceedings by reviewing the manuscripts that were submitted. Finally, we wish to Finally, we would like to express our gratitude to the Universidad Tecnológica del Suroeste de Guanajuato in the process of preparing this preparing this edition which can be consulted at <http://ecorfan.org/collections.php>.

*Guanajuato, Guanajuato  
September 01, 2023*

*RAMÍREZ-CANO, Teresa  
GORDILLO-SOSA, Jose Antonio*

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# 1 Physical and Mathematical Sciences and Earth Sciences

## Statistical Analysis of Psychological and Physiological Stress in Public Transport Drivers

### Análisis Estadístico sobre el Estrés Psicológico y Fisiológico en conductores del Transporte Público

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### Abstract

Public transport drivers face various factors that put their health at risk, not only in traffic matters, such as psychological stress, physiological stress, and working conditions. This paper aims to study said variables in public transport (bus) drivers in southern Tamaulipas, through a statistical study that can show the risk conditions for the study participants. To achieve this, a quantitative and descriptive research was carried out, with a convenient voluntary sampling of 77 surveys. Firstly, an exploratory factorial study was conducted on variables mentioned above, where the most reliable items were identified. Subsequently, a mediation analysis was carried through, resulting in the finding that the effect of psychological stress on physiological stress is less when mediated by working conditions.

**Public transportation drivers, Work Conditions, Psychological and Physiological Stress, Mediation Analysis**

## **Economic valuation of the impact on the Gulf of Mexico ecosystems: The deepwater horizon case**

### **Valoración económica del impacto sobre los ecosistemas del Golfo De México: El caso deepwater horizon**

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#### **Abstract**

The value of nature does not escape the interests of those who cannot conceive the limits of such an important and vital element. The valuation on nature is developed to generate a reference and take actions accordingly. In this regard, the Contingent Valuation method is the most commonly referred to, but it involves the design of a structured survey in which the main question is whether there is a willingness to accept an amount of money in compensation (DAC) for the loss of an eco-friendly good or service. Systemic or willingness to pay an amount of money to keep it (DAP). One or the other is defined without having a single referent and has been taken as a synonym of the total economic value. For this case, the problem of justifying the output value (DAP) was raised. The objective was to develop a methodology that based on data on household income and expenditure (ENIGH) in Mexico and applying a percentage to the expenditure per month, provided a basis for calculating that amount. The resulting methodology was accepted in the Valuation of goods and services provided by the Gulf of Mexico, after the Deepwater Horizon accident.

**Contingent valuation, Deepwater Horizon, Gulf of Mexico**

## Measurement of the management skills of academic directors in a higher education institution

### Medición de las habilidades directivas de los directores académicos en una Institución de Educación Superior

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#### **Abstract**

In this research were identified the necessary management skills to lead efficiently and effectively the educational institution under study and the measurement of their level of development was carried out; The instruments used were the structured and personal interview with the academic directors and the application of a survey to the teaching, administrative staff and academic directors, through Google forms. The essential management skills are motivating others, effective communication, analytical and creative problem solving, conflict management, time management, strategic planning and administration, the formation of work teams, adaptation to change, empowerment and delegation, emotional intelligence, participatory leadership, management and decision-making capacity, skills in the technical area of educational programs and mastery of the reference framework (regulations, guidelines and operating procedures). The level of performance is acceptable and very similar in the three groups of management skills (personal, interpersonal and group), the directors of the industrial electromechanical and economic administrative divisions obtained the highest evaluation in the three categories. In the three groups of skills the correlation is positive, being more significant that of the group of interpersonal skills.

#### **Measurement, Skills, Directives**

## **Calculation of liters to be sold at a gas station to optimize profits using the simplex method for a correct decision- making**

## **Cálculo de litros por vender en una gasolinera para optimizar las ganancias utilizando método simplex para una correcta toma de decisiones**

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### **Abstract**

Measurements of monthly sales were made from January to June 2021 at a gas station in order to obtain historical information and based on it determine, applying the simplex method for decision making, the correct number of liters of gasoline of the Magna (green) and Premium (red) type and Diesel necessary to obtain a maximum profit based on a budget that the company has. The monthly observations and the calculation were made using the EXCEL software with pre-recorded formulas to apply the simplex method and were developed during the period from July 05 to 09, 2021. This research work takes advantage of the benefits of the simplex method to find and optimize the best cost-benefit relationship and find the maximum possible profit in the sale of gasoline at a given station. The fluctuation in the changes of the gasolines costs in the last three years was considered to carry out the calculations of this investigation.

### **Measurements, Optimize, Fluctuation**

## **Deduction and construction of a discrete probability function (Binomial and Geometric) with analytical development of expected value and variance**

### **Deducción y construcción de una función de probabilidad discreta (Binomial y Geométrica) con desarrollo analítico de valor esperado y varianza**

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### **Abstract**

The present work deals with the construction and deduction of a discrete probability function, where the objective is the understanding of the mathematical foundations of probability for its correct application, interpretation and verification in solving probability problems. For this purpose we rely on the theory of didactic situations of Brousseau (1997) and Sadovsky (2005). Teaching strategies are proposed with didactic model materials that improve student learning by promoting the analysis and understanding of various foundations of probability (Panizza, 2003). The importance of close communication between teachers and students in the teaching-learning process for the resolution, interpretation and verification of probability problems is highlighted. The software used in this research was Wolfram Mathematica, which facilitates mathematical writing, calculations, and the construction of graphs using a simple interface. This software makes work easier by fostering student autonomy in the development of skills for analysis and problem solving. We believe that these materials will contribute to the improvement of teaching-learning processes on the fundamentals and concepts of probability.

### **Discrete Probability Function, Expected Value, Higher Education**

## **Detection of internal corrosion by long-pulse thermography and digital image processing**

### **Detección de corrosión interna mediante termografía de pulso largo y procesamiento digital de imágenes**

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#### **Abstract**

This paper addresses the problem of internal pitting corrosion in metals. The approach to solving this problem is carried out by means of long-pulse thermography (step heating) and digital image processing, using the median filter in the pre-processing and the Fourier transform in the processing. The long pulse thermography technique is an excellent way of detecting corrosion in metals. According to the state of the art, most of the works reviewed detect only the presence of external corrosion. In the experiments plates of different thickness were evaluated, one of 2 mm and another of 8 mm; this is another point in favor since most of the reviewed articles only focus on a single sample. In the development of this project, the following lines of research have been identified: implementation of new digital image processing methods, improvement of the thermography technique using other energy sources to heat the plates in a shorter time, exploring other functions of image processing in programming languages, carrying out tests with plates of different thickness and size, measuring the percentage of corrosion.

**Infrared Thermography, Long Pulse Thermography, Digital Image Processing**

## **Implementation of Matlab communication and Allen Bradley PLC for the control of the AMATROL JUPITER XL Robot**

### **Implementación de comunicación Matlab y PLC Allen Bradley para control del Robot AMATROL JUPITER XL**

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### **Abstract**

The article introduces a method to enable a robot, the "AMATROL JUPITER XL," without relying on its conventional controllers. Instead, a Human-Machine Interface (HMI) is employed using Allen Bradley's "ControlLogix 5550" software. This setup combines the engineering program MATLAB (via the Simulink extension) to develop control block diagrams containing calculations for robot design and comprehension. A data read-write interface is implemented on an "Allen Bradley 1756-L1" PLC, along with the integration of an Open Platform Communication (OPC) platform using the "RSLinx Classic" software. This configuration empowers the user to manipulate trajectories and objectives using calculations that depict the kinematics and dynamics of the mentioned robot. Consequently, this setup offers a control option that enables direct application of theoretical mathematical principles to the design and control aspects of robotics, leading to enhanced understanding of these principles.

**HMI, Control, Robotic**

## 2 Biology, Chemistry and Life Sciences

### **Nephroprotection of *p*-coumaric acid against sublethal dose of carbon tetrachloride in Wistar rats: histological evidence**

### **Nefroprotección del ácido *p*-cumárico ante la dosis subletal de tetracloruro de carbono en rata Wistar: evidencias histológicas**

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#### **Abstract**

In Mexico, chronic kidney disease is a public health problem, when is diagnosed in advanced stages, the only treatment options are dialysis, hemodialysis or organ transplantation, however, the health system does not have the economic capacity or the infrastructure to fully cover these treatments. Therefore, the objective of this research work was to evaluate the activity of the *p*-coumaric acid (*p*CA) as a possible nephroprotective agent against toxic carbon tetrachloride (CCl<sub>4</sub>)-induced kidney damage in male Wistar rats. Renal parenchyma was evaluated using two stains, hematoxylin and eosin (H&E) and periodic acid with Schiff's reagent (PAS). The administration of CCl<sub>4</sub> (4 g/kg, p.o., one dose) induced tubular necrosis and glomerular rupture within 24 h, with loss of microvilli and basement membranes, with widening of the lumen of the distal and proximal tubules. On the other hand, *p*CA (100 mg/kg, p.o., administered 24 h and 1 h before CCl<sub>4</sub> and 1 h after this toxic agent) showed nephroprotective action by reducing the presence of these morphological changes. Our results suggest for the first time that *p*CA, when administered preventively, slows the deterioration of renal structure induced by acute exposure to a sublethal dose of CCl<sub>4</sub>.

**Nephropathy, Acute kidney injury, CCl<sub>4</sub>, *p*-coumaric acid, Nephroprotective**



## **Direct Infiltration Effects of Dimethyl Sulfoxide into Ovarian Bursas on Spontaneous Ovulation and the Estrous Cycle of the Rat: Antagonism on the Type 2 Dopaminergic Receptor**

### **Efectos de la Infiltración Directa de Dimetil Sulfóxido Dentro de las Bursas Ováricas Sobre la Ovulación Espontánea y el Ciclo Estral de la Rata: Antagonismo del Receptor Dopaminérgico Tipo 2**

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## **Abstract**

We studied effects of microinjection (MI) into ovarian bursas (OB) of infiltrating agent dimethyl sulfoxide (DMSO) on number of ova shed (NOS) and estrous cycle (EC) of adult female rats with fourth day regular estrous cycles (REC), and we compared these effects with a MI of 100µg sulpiride solution in DMSO. Between 13:00- 14:00h of different days of EC, CER groups received 20µL of pure DMSO into both OB; the sham groups received MI with 20µL distilled water (H2O) into each OB. All rats with MI performed and an intact cyclic rat group were autopsied in the morning of next estrous vaginal shown (EVS). Both DMSO and H2O MI does not modify the EC duration and NOS. Other groups of cyclic rats received a MI with 20µL sulpiride solution into each OB and were autopsied at next EVS. Just the sulpiride MI performed on diestrous-1 day delayed 24h the next EVS, but that don't occur in other sulpiride groups. The NOS were not modified in all experimental group. The DMSO direct administration in ovarian tissue does not affect gonadal primordial functions and its use is recommended like an infiltrating agent of non-polar drugs.

**Spontaneous Ovulation, Oestrous Cycle, Dimethyl Sulfoxide, Ovarian Dopaminergic System, Sulpiride**

## Phytopathogenic fungi in seeds of the genus *Pinus*, stored in a gene bank

### Hongos asociados a semilla del género *Pinus*, almacenada en banco de germoplasma

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### Abstract

Phytopathogenic and saprophytic fungi present in seed with more than one year of storage were identified in the gene bank of the CONAFOR Jalisco delegation of the pine species: *Pinus douglasiana* P. devoniana, *Pinus hartwegii*, *Pinus oocarpa* and *Pinus pseudostrobus*. The mycoflora present, its level of infestation and phytopathogenicity were identified. Physiological and sanitary quality was determined. The 5 species analyzed presented at least 4 genera of fungi: *Fusarium*, *Penicillium*, *Aspergillus* and *Rhizopus* have been reported as storage fungi that cause seed deterioration. It is advisable to take measures to ensure sanitary quality, considering that the seed stored in the GDBs are the safeguard of forest genetic resources.

### Phytopathogenic Fungi In Seeds, Seeds *Pinus* Stored, *Pinus* Genebank

## **Effect of inoculation with mycorrhizal fungi on the production of native corn (*Zea mays* L.) in Valle de Santiago, Gto.**

## **Efecto la inoculación con hongos micorrícicos en la producción de maíz (*Zea mays* L.) nativo en Valle de Santiago, Gto.**

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### **Abstract**

The experiment was established from June-December 2022 in a randomised block design with three replications in experimental plot 1 of the Sustainable and Protected Agriculture Career of the Universidad Tecnológica del Suroeste de Guanajuato (UTSOE), located in the municipality of Valle de Santiago. The objective was to evaluate two varieties of native corn of the race *harinoso de ocho* (red and white) with inoculation with two commercial products containing mycorrhizal fungi (Rhizovibac® and Tec-myc®), a chemical fertilisation based on INIFAP (2015), of 80-40-00 and a fertilisation with vermicompost at a dose of approximately 100 g/mata. The experimental unit consisted of three furrows of eight metres long and 75 cm apart, where root volume - weight and yield were evaluated. Significant differences were found in Fisher's LSD ( $p \leq 0.05$ ) for the variables of root volume and weight in the white maize 128.3 cm<sup>3</sup> above the mean 72.1 cm<sup>3</sup> with chemical fertilisation; however, the criollo corn was the one that obtained the best yield. It can be identified that there is a high relationship between root volume and root weight. In the case of the treatments of the commercial products used in the white corn with Tec-myc®, the lowest root volume - weight and the lowest yield was obtained with the use of Rhizovibac® in comparison with the red corn.

### **Zea Mays, Mycorrhizal Fungi, Eight-Flour Corn**

## 3 Medicine and Health Sciences

### Drug use in university students

#### Consumo de drogas en estudiantes universitarios

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#### Abstract

**Goals** The general objective is to identify drug use in university students. The specific objective is to generate specific knowledge for the prevention of drug use at its various levels. **Methodology** The research is descriptive, non-experimental, cross-sectional. The participants are students of the subject “Risk behavior in educational contexts” at the Academic Unit of Psychology of the Autonomous University of Zacatecas. The Drug consumption Questionnaire (2009), prepared by the Social Security Institute of the State of Mexico and Municipalities, is used, the treatment of the data is through percentages. **Contribution** Obtained data, that lead to the knowledge of drug use in university students, will allow to base the intervention through programs aimed at eliminating drug use through prevention.

**Drug addiction, Risk, Students**

## **Ovum pick up (opu) and *in vitro* embryo production in pregnant cows (*bos indicus*) at the bachigualatito rancho, la trinitaria, Chiapas**

### **Aspiración folicular (opu) y producción in vitro de embriones de vacas gestantes (*bos indicus*) en el rancho bachigualatito, la trinitaria, Chiapas**

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#### **Abstract**

With the objective of determining the production, quality and development of bovine embryos (*Bos Indicus*), oocytes were collected from 14 females distributed in two groups: empty females (T1; n=7) and an experimental group of pregnant females (T2; n=7). The two groups were subjected to Ovum Pick Up (OPU) using disposable 18-gauge needles and a vacuum pressure of 100 mmHg. to later carry out in vitro fertilization (IVF). The study variables were the number of oocyte aspirated and fertilized and the expected embryos. A Wilcoxon test was performed for non-parametric data between two groups, finding no significant differences between treatments  $P > 0.05$ . 250 oocytes were recovered by fertilizing out of 190, obtaining a fertilization rate of 77%, reaching a transferrable blastocyst rate of 24% (45/190). In empty females (7), 113 oocytes were obtained, reaching a fertilization rate of 75% (81/113) and 25% transferable blastocysts (18/81). In the 7 pregnant females, 137 oocytes were collected, reaching a fertilization rate of 83% (109/137) and 23% transferable blastocysts (27/109). Follicular aspiration for in vitro fertilization of embryos from pregnant and empty cows is viable without differences between them, but being more variable in pregnant cows.

#### **Bovine, Blastocyst, Oocytes, In Vitro**

## **Differences between handgrip strength and anthropometric measurements with respect to the index of biological maturation in schoolchildren.**

### **Diferencias entre la fuerza de prensión manual y mediciones antropométricas con respecto al índice de maduración biológica en escolares**

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#### **Abstract**

The aim of this study was to identify the differences in handgrip strength values and anthropometric measurements with respect to the index of biological maturation (IMB) in schoolchildren. A descriptive study was conducted with a total of 256 schoolchildren (78 boys and 178 girls) aged 10 to 14 years. Body weight, height and sitting height (trunk and leg length) were measured using the ISAK protocol; also, manual grip strength was evaluated with a digital dynamometer and a formula of Mirwald et al. (2002) was used to determine the peak growth velocity (PVC) through the IMB. Subsequently, the sample was categorized into 7 groups according to their BMI (-1.5, -1.0, -0.5, 0, 0.5, 0.5, 1.0 and 1.5 years). Significant differences were found in schoolchildren in the 0.5, 1.0 and 1.5 years group with respect to the -0.5, -1.0- and -1.5-years groups in body weight, height, trunk and leg length, and grip strength ( $p \leq 0.05$ ). We conclude that the higher the biological maturation index there is a tendency for the anthropometry and grip strength values in schoolchildren to be higher with respect to those with a lower IMB.

#### **Biological maturation index, Anthropometry, Strength**

## **Multidrug-resistant *Klebsiella sp.*, one of the main etiological agents of urinary and respiratory tract infections in infants at southeastern Mexico**

### ***Klebsiella sp.* multidrogorresistente, uno de los agentes etiológicos principales de infecciones de los tractos urinario y respiratorio en infantes del sureste de México**

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### **Abstract**

**Goals.** The purpose of the work was to determine the *Klebsiella* species affecting hospitalized infants at southeastern Mexico, their antimicrobial susceptibility profile, the resistance phenotype, and the presence of ESBL enzymes. **Methodology.** From 2015 to 2020, a total of 794 records of bacteriological cultures positive to *Klebsiella* spp. were included. The frequencies of bacterial species, the biological material from which they were isolated, the age groups affected, the antimicrobial susceptibility profiles, the resistance phenotype, and the detection of ESBL enzymes were obtained. Data were analyzed using descriptive statistics and bivariate analysis, with a significance level of  $p \leq 0.05$ . **contribution.** *K. pneumoniae subsp. pneumoniae* was the most frequent bacteria isolated from urine, blood and bronchial aspirate samples. Most of them were resistant to beta-lactams and cephalosporins, in addition to exhibiting the MDR phenotype associated with the presence of ESBL enzymes. The susceptibility of the strains to meropenem and ertapenem indicates that carbapenems are the treatment alternative to combat these nosocomial infections in infants at southeastern Mexico.

***Klebsiella*, Nosocomial, Susceptibility, Southeastern**

## **Transfer Learning to improve the Diagnosis of Type 2 Diabetes Mellitus (T2D)**

### **Transfer Learning para mejorar el Diagnostico de Diabetes Mellitus Tipo 2 (T2D)**

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### **Abstract**

Transfer Learning is a Deep Learning technique that is currently being used in early and non-invasive diagnosis of T2D. The objective of this work is to design and implement a Transfer Learning model trained with images of skin patches belonging to healthy people and diabetic foot patients. The research methodology was constituted by 3 phases (Analysis and Design, Development and Evaluation) composed of 5 steps that comply with the proposed objective. Several convolutional neural network (CNN) models were developed: CNN built from scratch, AlexNet, CNN with data augmentation technique, FE-VGG16, FE-ResNet50 and FT-VGG16. These models were evaluated using a set of metrics derived from the confusion matrix, the Receiver Operating Characteristic curve (ROC) of each model and the value corresponding to the area under the curve (AUC). The best performance corresponded to FT-VGG16 model that fuses VGG-16 pretrained model with a block of fully connected layers. Finally, satisfactory results are reported and allow us to conclude that the application of Transfer Learning models for the classification of diabetic foot images constitutes a viable tool for the non-invasive diagnosis of T2D.

### **Transfer Learning, Classification, Diagnosis**



## **Vision system to obtain spatial coordinates in bony protuberances of the human body through ArUco markers**

### **Sistema de visión para obtener coordenadas espaciales en protuberancias óseas del cuerpo humano a través de marcadores ArUco**

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#### **Abstract**

Actually, the vision systems have a great impact in technological innovation, since they represent the eyes of any device or machine, therefore the importance of this is paramount. On the other hand, in one of the branches of biomechanics studies are carried out to diagnose disorders in the gait cycle of patients, normally a physiotherapist performs specific exercises to determine if there is an abnormality during the gait cycle, however, the accuracy of the diagnosis can become uncertain if the physiotherapist has carried out several continuous studies and factors such as lighting of the place or eye fatigue cause alterations in its diagnosis, therefore, with the development of this project it is intended to make a vision system that, from markers positioned on bony protrusions on the lower part of the human body, get the spatial coordinates (X, Y and Z), information that adding a post processing would allow obtaining data such as angular movements, angular velocities and custom gait cycles, fundamental data in the development of prostheses, orthoses or exoskeletons, and considering that the project is carried out in free software, its implementation becomes more accessible.

**Vision systems, Spatial coordinates, Python**

## **Chromate resistance in *Cupriavidus metallidurans* CH34: Molecular modeling from ChrC superoxide dismutase**

### **Resistencia a cromato en *Cupriavidus metallidurans* CH34: Modelamiento tridimensional de la superóxido dismutasa ChrC**

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#### **Abstract**

Chromate has become an environmental pollutant present in different ecosystems due to its use in industry. Bacteria have evolved to resist stress produced by chromate. Among chromate-resistance mechanisms we can list Reactive Oxygen Species detoxification systems. Cme-SOD (ChrC) protein from *Cupriavidus metallidurans* CH34 is a superoxide dismutase that mitigate oxidative stress caused by chromate. Cme-SOD protein belongs to Fe and Mn-dependent SOD family (pfam02777). The objective of this study was to analyze the three-dimensional structure of the Cme-SOD protein, for which monomer and tetramer models of the enzyme were built. In the monomer model it was observed that Cme-SOD has a characteristic two-domain structure from iron-dependent SOD, additionally, Cme-SOD has an iron-binding site formed by conserved residues H26 and H75 in the N-terminal domain, and D157 and H161 in the domain C-terminal domain. It was show that chromate stress response SODs have a non-conserved residues in the active site (R37, N59, S71, D143 and Y164). These findings suggest the presence of a novel active site in this family of enzymes.

***Cupriavidus Metallidurans* CH34, Fe-Superoxide Dismutase, Enzyme**

## **Characterization of composite material specimens manufactured in 3D printing for the construction of a shoulder Rehabilitation Prototype**

## **Caracterización de probetas de material compuesto fabricadas en impresión 3D para construcción de prototipo rehabilitador de hombro**

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### **Abstract**

The present work seeks to characterize polymer specimens with aluminum and stainless steel reinforcements, using additive manufacturing for their elaboration and thus increase their tensile strength and implement them for industrial, medical and automotive use. The methodology to follow consists of a documentary investigation of related articles and standards such as ASTM D638, where the tensile properties of plastics are specified, continuing with the manufacture of the test tubes in a 3D printer, this according to the corresponding standard., to later carry out stress tests on the universal machine. The contribution of the work developed lies in the increase in the tensile strength of the composite material experienced, resulting for a first test tube an increase of 52.4% in the maximum tensile strength with an aluminum reinforcement, and an increase of 59.1%, this with a steel reinforcement, in the second specimen submitted to tests with aluminum reinforcement an increase of 20.04% was obtained and with the steel reinforcement it was 84.54%.

### **Test Tube, Polymer, 3D**

## **Physical activity and sport: design of a training project for basic education from the New Mexican School**

### **Actividad física y deporte: diseño de un proyecto formativo para la educación básica a partir de la Nueva Escuela Mexicana**

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### **Abstract**

Objective: to describe the methodology that was carried out for the design of the project "Physical Activity and Sport in Educational Extension" and the characteristics of body composition, physical capacity, basic movement patterns and sense of belonging of the students. first, second and third grade schoolchildren attached to a federal elementary school of the Secretary of Public Education of the state of Sonora, in Mexico to participate in the project. The sample consisted of 95 boys and girls from third to sixth grade with an age between 6 and 12 years. Prior to the implementation of the project, an evaluation of body composition, physical capacity, basic movement patterns (BMP) and sense of belonging was carried out. Results: 17.9% (f = 17) are overweight and 14.7% (f = 14) are obese. The data showed that 24.3% (f = 26) sleep the recommended hours. The physical and sports activity that they perform the most is running (31.6%; f = 30). Contribution: The results obtained will help in the planning, redesign, action and control in the contents of the projects of the Physical Education teachers in Educational Extension associated with the project.

### **Education, Physical Activity and Body Composition**

## 4 Humanities and Behavioral Sciences

### Parental practices and addictions in the adolescent population

#### Prácticas parentales y adicciones en población adolescente

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#### Abstract

**Objectives:** Identify the protection and risk factors for substance use based on parenting practices. **Methodology:** The research carried out was descriptive in scope, from a mixed approach (qualitative and quantitative) using the observational, descriptive and cross-sectional method, in turn, the quantitative cut is integrated by applying standardized instruments such as the Parental Practice Scale for adolescents and Depression Scale of the Center for Epidemiological Studies CES-DR, for this, a sample of 57 adolescents aged 15 to 17 years was obtained. **Contribution:** It was found in the results that the nuclear family is a protection factor, however, in some cases it is the same that becomes a latent risk factor in adolescents, through the impositions generated by the parents, using a parentage style of authoritarianism, coupled with the little communication that exists between family members.

#### Family, Risk, Addictions

## **An opportunity to develop the skills of the Students, "Marketing in Action" a collective meeting place**

### **Una oportunidad para desarrollar las competencias de los Estudiantes, "Marketing in Action" un lugar de encuentro colectivo**

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### **Abstract**

Goals demonstrate the impact and benefit caused by the Mkt in Action institutional event, which is organized by the Business Development career, and which seeks the active participation of the student body. Involve the participation of students to demonstrate the strengths and areas of opportunity through the participation of expert speakers in the area, including the participation of alumni. Promote public relations of the student body of the business career with the business group of the region. Methodology A quantitative approach to data collection and statistical analysis is used. Descriptive approach Greater student participation is sought as an audience and as organizers; as well as demonstrate the result of public relations that generate the involvement of the business sector towards the event. Quantitative approach Population of the Business Development Educational Program of 331 people; with a sample of 116 participants. Investigation What is the impact and benefits generated by the Mkt in Action for the development of the students of the Educational Program? Contribution Students carry out activities related to logistics, administration, design, audiovisual production, management of social networks and management of sponsors in order to generate strategic synergy with local companies.

### **Development, Analyze, Skills**

## **High-performance teams in the institute of education the state of Guanajuato, México**

### **Equipos de alto rendimiento en una institución de educación superior Del Estado de Guanajuato**

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#### **Abstract**

The purpose of this project is to identify the factors that impact the development and consolidation of high performance teams in a higher education institution in the state of Guanajuato during the year 2022. A diagnostic of organizational climate was elaborated to know the perception that workers have of their work dynamics, a questionnaire was applied to a sample of 128 collaborators from a population of 189 workers, using the Likert scale, considering a total of 40 topics the sample is representative having a confidence level of 95% with a margin of error of 5%. Para interpretar los resultados se empleó medidas de tendencia central como la moda, medias y medianas, de la manera siguiente: respuestas positivas (niveles 4 – de acuerdo y 5 – totalmente de acuerdo) y negativas (niveles 2 – en desacuerdo y 1 – totalmente desacuerdo). The results showed the need to establish leadership strategies, consolidate learning curves, boost motivation, promote creativity and communication that impacts on quality in service and belonging to the organization.

**Consolidation, Collaborators, Diagnostic**

## **Wax obtained from the insect *Dactylopius coccus* Costa, study for its application in natural cosmetic products**

### **Cera obtenida del insecto *Dactylopius coccus* Costa, estudio para su aplicación en productos cosméticos naturales**

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### **Abstract**

The insect *Dactylopius coccus* Costa produces a white wax that serves to protect itself from the environment, at the time of harvesting the insect, the wax is separated by sifting, in intensive production of the insect a large amount of wax is discarded. Therefore, the objective of this work was to carry out a physicochemical analysis of three samples from different producers obtained by the same method, to determine if it meets the characteristics to be used in any natural product. The methodology consisted of determining the organoleptic characteristics, as well as the color by means of a colorimeter, determination of pH, melting point, and percentage of humidity. The results obtained were compared with a synthetic (microcrystalline) wax used in a cosmetic product, to see if it could be substituted by the analyzed wax. It was found that it was possible to substitute the synthetic wax for the natural wax due to its conflicting characteristics. Therefore, it is concluded that this wax can be used in the elaboration of natural products. Although it would be necessary to carry out a series of tests of the final product obtained with and without the wax. To determine if the substitution is favorable or not.

### **Wax, Insect, Cosmetics**



## **Application of logistic regression in industrial maintenance management**

### **Aplicación de la regresión logística en la gestión de mantenimiento industrial**

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### **Abstract**

In the area of industrial maintenance, the application of statistical methods is essential, in that sense, the purpose of this analysis is to explore logistic regression as an element of industrial maintenance management. By means of logistic regression, a predictor equation for the response variable, machine failure, is obtained by correlating it with categorical and continuous predictor variables. The continuous explanatory variables are machine age, mean time between failures, mean time to repair and the categorical ones are application of preventive and corrective maintenance. The results obtained indicate that only the explanatory variable preventive maintenance is significant to the response variable by applying the Wald test and this result was also validated with goodness-of-fit tests. Logistic regression is more used in other areas, such as health, however, in maintenance categorical variables are used such as machine with autonomous maintenance whose result is yes/no, therefore, it is important to incorporate a regression model that considers different types of independent variables, in addition to the use of emerging technologies of Industry 4.0 such as Machine Learning for the prediction of scenarios for efficient maintenance management.

### **Correlating, Logistic Regression, Predictor, Preventive, Corrective**

## **TikTok as a learning strategy for English language proficiency in higher education**

### **TikTok como estrategia de aprendizaje para el dominio del idioma inglés en la Educación Superior**

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#### **Abstract**

TikTok is used as an innovative language learning tool to improve fluency in English, favoring communication and grammar skills among university students. The study shows the analysis of video creation with seven specific tasks, namely: cultural investigations, personalized vocabulary speeches, grammar-focused discussions, role-play conversations, oral reading reports, listening comprehension and grammar explanations. The students created the TikTok videos and interacted with their peers; and these were used as part of the assessment of their subject. For data collection, a questionnaire was designed and included, in addition to conducting focus groups to collect information about the experience of its implementation. The results indicate that TikTok videos, as short lessons, integrate seamlessly into students' academic routines, allowing for error correction, grammar and vocabulary practice, improved pronunciation, increased confidence in speaking English, and quick class review. It is suggested that optimal recording conditions and creative effects be taken into account, respecting the privacy of those who create it. In conclusion, TikTok is considered to be a valuable tool to improve English language proficiency, promotes creativity, critical thinking and understanding of concepts. It is suggested that research be continued to explore long-term impacts.

**Educational Innovation, TikTok, Higher Education, English Teaching**

## **Cognitive scaffolding model for project management that integrates the development of academic skills and a sustainable approach**

### **Modelo de andamiaje cognitivo para la gestión de proyectos que integran el desarrollo de competencias académicas y el enfoque sustentable**

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### **Abstract**

**Objectives:** With the purpose of guiding the development of research projects with a sustainable approach, in order to solve the dialectic between chaos and opportunity, posed by technological development, a cognitive scaffolding model is developed, applicable to the development of projects in any field of knowledge. This scaffolding is proposed as a sustainable model in itself, by integrating competency-based training as the main structure and as part corresponding to the social pillar or sphere; Life Cycle Analysis, indicators and other environmental issues make up the environmental pillar or sphere and the technological and commercial part make up the economic pillar or sphere. **Methodology:** A documentary and qualitative research is proposed for the conformation of the scaffolding model, which is validated through the application to a concrete case. **Contribution:** With a holistic vision that integrates sustainability and competency-based training, a technological development was achieved that integrated key determining concepts for its design, construction, operation and market vision. The model is a guide that structures the basic information in force in the global agenda, flexible, allowing the incorporation of the specific theoretical framework of the project in question.

**Cognitive holistic scaffolding model, Skills for life, Sustainable engineering**

## **Determination of the degree of burnout syndrome in engineering student-workers of the UTCH**

### **Determinación del grado del síndrome de burnout en estudiantes-trabajadores de ingeniería de la UTCH**

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### **Abstract**

The aim of the following article is to identify the degree of burnout syndrome in engineering students from the evening shift, who work full time in the morning. The objective is to obtain accurate data to improve the tutorial action plan from UTCH. The research starts from the hypothesis that engineer students from the evening shift, who work, experience a high degree of emotional exhaustion, depersonalization and difficulty in personal fulfillment (Burnout). To achieve this, 175 Test «Maslach Burnout Inventory» (MBI), were administered and analyzed using the categorization by summation of classes to determine the level of burnout among students. The categories are validated individually using Cronbach Alfa, resulting in scores above 70%. The items are analyzed individually and in groups according to their category and dispersion in respect to normality. Finding validity in the research generates significant contributions to improve the strategies of the Tutorial Action Program and therefore address the socioemotional necessities of the students.

**Burnout, Students-Workers, Mentoring**

## **Training Needs in Mypes managers in Izúcar de Matamoros**

### **Necesidades de capacitación en gerentes de Mypes en Izúcar de Matamoros**

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#### **Abstract**

Training is an important factor for the growth of companies. It has been written about the training and preparation of the workers but little has been addressed about the training of the employer himself or the managers of the organizations. The objective of this research was to identify training needs of managers of micro and small companies in the municipality of Izúcar de Matamoros, Puebla, a city of interest for being the location of the Technological University of the same name. It is a quantitative, cross-sectional and descriptive investigation. A questionnaire with 12 items with a Likert-type scale and multiple choice was applied. It was observed that 88% of those surveyed have not taken training or only sometimes, this because they do not know training companies and because they consider that this is expensive. They also highlight important findings on the topics in which they consider they need to be updated. With this, it was detected that there is a potential market for the University to offer training courses for entrepreneurs through the modality of training or continuing education. Thus contributing to the permanence of Mypes in the market and to the economic development of the region.

**Training, Mypes, Managers**

## **Degree of application of social responsibility by gender and age and educational level of the owners of the Mypes in Chihuahua City**

### **Grado de aplicación de la responsabilidad social por sexo, edad y nivel académico de los dueños de las Mypes de la Cd. de Chihuahua**

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### **Abstract**

The present research has the objective to determine the degree of application of social responsibility in Micro and Small Enterprises (Mypes) in the city of Chihuahua, considering the variables of gender, age and academic level of the owners. For this investigation a quantitative method with a descriptive scope is employed, as this research seeks to specify the profiles (by gender and age) of Mypes owners in the city of Chihuahua and the degree of application of social responsibility in their companies. The design is cross-sectional. A random sample of 450 micro and small companies in the city is examined. The results allow gender and age to determine the degree of application of social responsibility in local businesses. This research has allowed us to determine the degree of social responsibility implemented in the companies of this city in relation to age, gender, and educational level. Among the findings, it was found that companies led by men and with a higher educational level are the ones where more social responsibility actions are implemented.

**Social Responsibility, Micro and Small Enterprises, Educational Level**

## **Digital tools as educational methodology in higher level teaching practice**

### **Herramientas digitales como metodología educativa en la práctica docente de nivel superior**

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#### **Abstract**

In the present study two objectives were proposed, to know the use and degree of technological literacy in higher education teachers and to identify the degree of implementation of the educational methodology through ICT in the classroom in higher education teachers. The methodology was extracted with a quantitative approach with a descriptive transactional design. The used criteria were the problem is observable and measurable. The procedure used for data collection consisted in the administration of the Digital Competence instrument of the University Teaching Staff, which demonstrated the use of digital tools in educational methodology. It was validated by six experts and has a confidence index of .95 Cronbach's alpha. The contribution of this study focused on the identification of schemes for the use of digital tools as an educational methodology, as well as the periodicity with which it is used, the most used tools or the preferences of the users.

**Digital Tools, Technological Methodology, Didactics**

## **Influence of work motivation on the performance of employees in a public company**

### **Influencia de la motivación laboral en el desempeño de los empleados en una empresa pública**

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#### **Abstract**

The objective of this research is to know if there is an influence of work motivation on the performance of its workers. An investigation was carried out on the concepts related to the subject of study, in which indications are reported that there is no motivation towards employees, which generates low performance. The importance of carrying out the study, the beneficiaries and the impact it could have for future research are mentioned. The research presented is of a quantitative type with a cross-sectional design and an instrument was applied through a non-probabilistic sampling for convenience to the company. The procedure that was carried out to obtain results was to request permission and authorization from the organization. Subsequently, a survey was applied in Google Forms to 100 collaborators, sent by WhatsApp. With SPSS,  $\alpha$  and graphs of results were obtained; the most significant questions were: Do you instruct the trained personnel in the new processes? (70% agree), (23% disagree) and (7% indifferent); Does the pension they receive grant security in the future (60% agree), (23% disagree) and (17% indifferent). In conclusion, the company under study shows favorable results and can improve its organizational culture.

#### **Work Motivation, Performance, Influence**



## **Perception of the students of the Human Capital Administration career on the return to face-to-face classes**

### **Percepción del alumnado de la carrera de TSU en Administración área Capital Humano, sobre el regreso a clases presenciales**

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### **Abstract**

The objective of this article was to analyze the perception of the students of the Human Capital Administration career on the return to face-to-face classes to determine the impact of COVID-19 to implement information strategies in future scenarios. A descriptive and explanatory design was used, as well as a type of cross-sectional study. 240 students collaborated, of which only 212 were required according to the sample size. The following variables were considered: Perception of risk, lifestyle, interpersonal relationships, use of ICTs, emotional support, and economy, which comprises 36 items distributed in seven blocks. The results obtained managed to identify the perception of the students in relation to the training strategies in times of pandemic, the strengths and weaknesses were distinguished, for the achievement of the competencies of the career, as well as the emotional, psychological, social, technological impact., economical, and familiar that the students experienced. Finally, this was a search among the same students of the career, where their experiences marked by the health event were known. This project provided listening and awareness with the student community.

**COVID-19, Perception, Risk, Professional**

## Perception of the students of the Business Development career on the return to face-to-face classes

### Percepción del alumnado de la carrera de Desarrollo de Negocios sobre el regreso a clases presenciales

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### Abstract

The objective of this article was to analyze the perception of the students of the Marketing Area Business Development career on the return to face-to-face classes to determine the impact of COVID-19 to implement information strategies in future scenarios. A descriptive and explanatory design was used, as well as a type of cross-sectional study. 240 students collaborated, of which only 212 were required according to the sample size. The following variables were considered: Perception of risk, lifestyle, interpersonal relationships, use of ICTs, emotional support, and economy, which comprises 36 items distributed in seven blocks. The results obtained managed to identify the perception of the students in relation to the training strategies in times of pandemic, the strengths and weaknesses were distinguished, for the achievement of the competencies of the career, as well as the emotional, psychological, social, technological impact., economical, and familiar that the students experienced. Finally, this was a search among the same students of the career, where their experiences marked by the health event were known. This project provided listening and awareness with the student community.

**COVID-19, Perception, Risk, Professional**

## **Impact of sustainable tourism in food and beverage establishments, a case study in Acapulco**

## **Impacto del turismo sostenible en los establecimientos de alimentos y bebidas caso Acapulco**

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### **Abstract**

The following research aims to know the perception of current tourism development in food and beverage establishments located in the three main popular tourist areas in the port of Acapulco; golden, traditional and diamond itself, which is considered the most emblematic in Guerrero and from which the largest economic benefit in the state is perceived > 19,571,000 dollars per year. (National Institute of Geography and Statistics, s.f.) The foregoing is in order to know how to preserve natural resources and the local culture that is being passed down to generations. The study carried out is in a quantitative method with a cross section, 289 surveys were applied within the "high season" for the tourism sector, directed to the visiting diners of that holiday period that has a significant tourist influx to the port. The results of the research detonate awareness and contribute to knowledge about the relevance that sustainable tourism currently has, such as economic development and heritage conservation, it is a significant finding for analysts and researchers in the area of social sciences that has an impact on an important analysis of conscience for those who enjoy a socially responsible vacation

### **Tourism, Sustainability, Food and Drink Establishments**

## **Socioemotional competencies in adolescents (high school level) for the prevention of risk behaviors**

### **Competencias socioemocionales en adolescentes (nivel secundaria), para la prevención de conductas de riesgo**

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### **Abstract**

The main objective of this study is to identify the socioemotional competencies of adolescents in secondary education who are currently in the first grade of secondary school (school year 2022-2023), which contribute to a better interaction with their peers and environment, in addition to preventing possible risk behaviors. It will be approached from a quantitative approach, with a descriptive scope. The sample consists of 19 students from a private institution, located in the municipality of Guadalupe, Zac. A questionnaire called emociogram was applied through the Habilmind platform, to identify the main characteristics regarding the emotional scale, which in turn is composed of five subscales such as: empathy, assertiveness, interpersonal emotional regulation, teamwork and conflict resolution. The results show us some areas of opportunity that should be emphasized in order to improve the results and thus improve the socioemotional competencies of adolescents.

### **Socioemotional Competencies, Adolescents And Risk Behaviors**

## **The compliance of the intellectual property rights and the citation methods in the process of doing a thesis research**

### **El cumplimiento de la propiedad intelectual y las formas de citar en la elaboración de la investigación de tesis**

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#### **Abstract**

This article analyzes the way of quoting the information by two of most important citation methods for consulting information for the thesis research. The author is responsible for the correct use of the intellectual property of another authors who are consulted in the tesis research. And the author is too responsible of the information research for the work development. Two most commonly used ways of quoting are American Psychological Association (APA) and National University of Mexico (UNAM). The author of this essay proposes a way of quoting. In those ways of quoting are extracted with author comments how to include the information in reference and content cards wich is done by a little part of the researchers actually. Besides quoting duty, it is acomplished the statement of the copyright law and the international agreements when the author of the information is recognized giving them their credit. It is very important for those who dedicate to research.

#### **Intellectual Property**

## **Education at the middle and higher level: information technologies, pre-eminence in teaching and learning processes in period of pandemic**

## **Educación en el nivel medio y superior: tecnologías de información, preeminencia en los procesos enseñanza y aprendizaje en periodo de pandemia**

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### **Abstract**

At present, the influence generated by globalization, the knowledge society and information technologies (IT) propose challenges to educational institutions, the above due to changes related to educational models, job skills, interaction styles and communication between the different social sectors, and even in unexpected phenomena, such as the pandemic generated by COVID-19, a situation that caused chaos in the teaching and learning processes, where teachers and students had overnight the need to resort to technological tools and distance learning platforms in order to conclude a complicated 2020-2021 school year. This document analyzes the increasing influence of IT, the way in which these have increasingly modified educational spaces, for such analysis relevant IT issues that impact the teaching and learning processes are reviewed, at the same time it is also examined how the IT facilitate new pedagogical schemes, thus generating a range of possibilities in training modalities both for the field of online education or for face-to-face education, or even for mixed education (b-learning). Regarding academic training with IT, these allow differentiating a more influential training in students, discovering in them skills to solve problems, professional skills and complete learning, turning them into increasingly competent individuals.

**Knowledge Society, Information Technologies, Educational Models, COVID-19, Online Education, Teaching and Learning, B-Learning**

## **Teaching tasks of teacher trainers: Study of their influence on initial teacher training**

### **Las tareas de enseñanza de los docentes formadores: Estudio de su influencia en la formación inicial de los profesores**

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#### **Abstract**

The present work arises from evaluation results (OECD, 2017) that reflect low learning in primary school students in the subject of mathematics, as well as the difficulty of understanding fractions. The study was carried out with the aim of identifying strategies used by teachers' trainers for their students to appropriate the planning of mathematics in the subject of fractions, as well as the elements they take into account for their design. A qualitative approach was used with the case study methodology. The sample consisted of two teachers attending the second semester of the Bachelor in Primary Education and 6 students. The results show that teachers in training identify elements that should be considered to design the planning and are based on the Theory of Didactic Situations, this by influence of the strategies designed by the trainers of the normal school.

**Planning, Theory Of Didactic Situations, Fractions**

## **Development and implementation of the academic portal for optimization of services**

### **Desarrollo e implementación del portal académico para la optimización de servicios**

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### **Abstract**

The Escuela Normal Oficial de Irapuato (ENOI) emerged in 1951 and has distinguished itself as a higher- level Institution dedicated to the training of professionals in preschool, primary, and inclusion education, through the proper operation of its plans and current programs. Nowadays, technology has allowed people to communicate or transmit information through the internet. Despite that, there are still institutions that do not have these technologies, as was the case of ENOI which lacked an official page website with its domain. The lack of an official site meant that the public did not have easy access to information related to the institution. The objective of this project was to facilitate the administration and display of the information presented on their page through a system that allows them to update it without the need to know any programming language, as well as to give the page its own identity. of the institution, set up the website on its own server with its unique domain, and develop different profiles or roles for information management. With this, it was possible to give the ENOI a place where it can share relevant information and serve as a main page where you can enter other sites of interest for people related to the institution. of the institution and spread false information.

### **Administration, Domain, Website**



## **Gamification in the field of initial music education. An innovative teaching-learning strategy**

### **La ludificación en el ámbito de la educación musical inicial. Una estrategia de enseñanza-aprendizaje innovadora**

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#### **Abstract**

This paper presents an alternative way of approaching music education for kids in initial education using gamification as a strategy. Gamification is an educational tool of relatively recent creation, which is based on game theory in the computer field, but in recently days it has been easily adaptable to the classroom and especially in early childhood musical education. This research aims to identify the constituent elements of a gamification based on Marczewski's proposal, to later devise a gamification plan in the field of initial music education. To achieve this objective, an analysis of the main constituent elements of gamification is carried out, with the purpose of structuring them in a way that allows the creation of educational planning with didactic sequences based on the project method, being quite innovative in the musical educational field.

#### **Intrinsic Motivation, Gamification, Musical Education**

## **Sustainable Carpet: Attitudinal Strategy with emphasis on sustainable development**

### **Alfombra Sostenible: Estrategia Actitudinal con énfasis en el desarrollo sostenible**

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### **Abstract**

The generation of attitudinal strategies in students is fundamental for their integral development and the construction of a balanced quality of life. These strategies allow activating skills that go beyond technical and academic knowledge, as they promote social, environmental and economic awareness. The objective of the research is to identify the perception of the students of the administration career of the attitudinal strategy "Sustainable Carpet" with an active participation. The methodology is based on a qualitative paradigm; interviews were conducted with thirty-two people using a non-probability sample. The main contribution is the creation of an attitudinal strategy with fifteen simple and easy steps with a high feasibility for the case studies belonging to the administration career. Therefore, to generate a degree of awareness it is useful to start from the breach of a human right and this will help to take a personal position in this regard, if it is accompanied by collaborative and cooperative activities, as well as active learning, we are in the presence of learning meaningful and experiential.

### **Attitudinal Strategies, Perception, Active Learning**

## **Self-perception of Digital Competences in Higher Education Teachers**

### **Autopercepción de las Competencias Digitales en Profesores de Educación Superior**

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#### **Abstract**

The present study had two research objectives: (a) Analyze the self-perception that higher-level teachers have about the mastery of digital skills in relation to the areas of information, communication, content creation, security and problem solving; and (b) Identify the level of mastery of digital skills presented by higher level teachers in relation to the areas of information, communication, content creation, security and problem solving. The methodological design had a quantitative approach, which allowed the collection of information required to achieve the objectives set. With this study, we contribute to the frontier of knowledge regarding the gaps between the use and application of digital skills, by the teaching staff of public institutions of higher level.

**Digital Competences, Teacher Self-Perception, Higher Education**

## **Collaborative Software Project Development with Source Code Repository**

### **Desarrollo Colaborativo de Proyectos de Software con Repositorio de Código Fuente**

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#### **Abstract**

Working on projects in isolation presents significant limitations. The lack of interaction and collaboration among students hinders the learning of diverse approaches, limits the expansion of understanding on a subject, and can decrease students' commitment and interest. Additionally, the absence of interaction negatively affects the development of key skills for academic and professional success. In the field of software project development, having a centralized source code repository is essential. It facilitates collaboration among team members, allowing them to work on the same project, make changes, review code, and solve problems together. It provides tools and functionalities that improve coordination and version control, resulting in more efficient and higher quality development. In summary, this article highlights the importance of collaboration among students and the use of centralized source code repositories to facilitate interaction, knowledge sharing, and ensure the quality of work in both academic and professional settings. It promotes collaboration through group projects, team activities, and online platforms that facilitate the exchange of ideas

#### **Collaboration, Repository, Source Code**

## **Proposal for educational intervention in the face of external aspects that prevent the development of mathematical competence in the training of engineers**

### **Propuesta de intervención educativa ante los aspectos externos que impiden el desarrollo de la competencia matemática en la formación de ingenieros**

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### **Abstract**

**Objectives** To establish a proposal to improve the school performance of engineering students. **Methodology:** The proposed research methodology was qualitative by the controlled trial method. Applied to five groups, 3 of first semester and 2 of fifth semester, to identify the existing problems on academic performance considering as variables: bad grades, adaptation, study habits, reading comprehension, mathematical reasoning, emotional problems. With the results obtained in the diagnosis, some improvement strategies were established and throughout the semester the detected students were accompanied, these strategies were modified according to the pre-results that were given. To compare the results obtained, there was a group of first and another of fifth semester to which the improvement strategies were no longer applied. At the middle and end of the semester, evaluations were applied to identify the effectiveness of the measures used. **Contribution:** This proposal for educational intervention arises as a result of the pilot test carried out, it contains the actions implemented considering the modifications that were made.

### **Intervention, Educational, Mathematics**

## Rainwater harvest, an alternative for water supply for human consumption

### Cosecha de agua de lluvia, una alternativa para el abastecimiento de agua para consumo humano

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#### Abstract

One of the millennium development goals is to have the world population without sustainable access to safe drinking water and basic sanitation. Another challenge of the millennium also states that every human being has the right to clean water, which implies access to minimum quantity and quality values to meet their basic needs; however, rapid urbanization, industrialization and population growth, have reduced the availability of drinking water. In this sense, several alternatives have been practiced in order to solve this problem. Recent studies have demonstrated the economic, social and environmental benefits of harvesting rainwater in different regions, water harvesting systems provide flexible solutions that can properly meet the needs of existing and future demands. The overall objective of this research was to monitor the quality of water stored in rainwater harvesting systems installed in the state of Zacatecas, Mexico this technology was developed by a group of researchers CA-177 of the Autonomous University of Zacatecas. The determination of cations Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>2+</sup>, Ca<sup>2+</sup> and trace elements was performed by atomic absorption (AA Team ThermoScientific ICE 3300) under the NMX-AA-012-200-SCFI APHA standard. Results indicate that quality of water stored in tanks receiving rainwater meets the Mexican Standard NOM-127-SSA1-1994 and WHO for human consumption. It is concluded that physico-chemical and biological characteristics of harvested water is suitable for all purpose, demonstrating that this technology is inexpensive and represents a sustainable alternative to supply water in marginal areas of Zacatecas and Mexico.

#### Rainwater, Tank Reservoir, Acceptable Quality

## **Technology-mediated collaborative activities for integration into university life in the introductory engineering course**

### **Actividades colaborativas mediadas por tecnología para la integración a la vida universitaria en la asignatura de introducción a la ingeniería**

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#### **Abstract**

The article presents an educational intervention project implemented in the Introduction to Engineering subject of the Computer Engineering Educational Program of the Centro Universitario de Ciencias Exactas e Ingenierías of the Universidad de Guadalajara, developed by the Investigation Groups UDG-CA-991 Desarrollo de Competencias Profesionales en Ciencias Computacionales and the UDG-CA-863 Gestión y Desarrollo de Competencias en Entornos Virtuales during the periods 2022B and 2023A which developed strategies that integrated actions and resources for collaborative work mediated by technology for the integration of students into the university life, under a mixed model and a section group as a sample, achieving a pedagogical proposal assisted by technology focused on the development of significant learning, in which an impact evaluation was applied with interview and survey instruments, as well as satisfaction and evaluation, considering the institutional, teacher and student dimensions or categories. The project was focused with the principles of continuous improvement.

**Collaborative Work, IT In Education, Meaningful Learning**

## **What does interbehaviorism have to contribute in the educational field?**

### **¿Qué tiene que aportar el interconductismo en el ámbito educativo?**

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### **Abstract**

The purpose of this paper is to discuss some of the applications of the interbehavioral model to the system of educational psychology. Some of its foundations are exposed, its application as a logic of theoretical construction, culminating with some characteristics of its technological application, in continuity with the theory of behavior, in the science of psychology. The technological model of didactic discourse is rescued, and its current and potential contributions in the educational field are valued. It is concluded that there is significant potential for the development of interbehavioral thinking in the field of psychology, but researchers need more interest in it.

### **Interbehaviorism, Technology, Applications**



## 5 Social Sciences

### **Impact of the covid 19 pandemic on the tools and sales strategies of micro and small businesses in the city of Chihuahua**

### **Impacto de la pandemia de covid 19 en las herramientas y estrategias de venta de las micro y pequeñas empresas de la ciudad de Chihuahua**

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#### **Abstract**

Goals: Learn about the impact of the Covid-19 pandemic on the sales tools and strategies for Mypes (Micro and small enterprises) in the city of Chihuahua, Mexico.

- Identify sales tools and strategies most used before and after the pandemic.
- Learn which strategies are designed and implemented after the pandemic.
- Evaluate if the new sales strategies applied, generate an increase in the Mypes profit.
- Direct sales strategies based on digital marketing tools.

Methodology: A quantitative research is carried out through the survey method whose purpose is to identify the relationship between sales strategies and the continuance in the market of Mypes in the city of Chihuahua, which are applied before, during, and after the pandemic caused by the SARS-CoV-2 virus. The purpose of this research is to study a representative sample of companies through a descriptive investigation designed with a questionnaire of 11 closed questions: dichotomous and multiple choice. A sample of 211 companies was obtained, in which only Mypes were considered to carry out the research.

Contribution: Digital marketing is necessary for companies if they want to stay in the market and increase their share.

#### **Pandemic, Strategy, Marketing**

## Quality of university life in southern Sonora

### Calidad de vida universitaria del Sur de Sonora

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### Abstract

The objective of the study was to determine the quality of university life in southern Sonora through the application of a measurement instrument. The method used in the present investigation is mixed, non-experimental, transversal, for this work a sample of 372 students was selected, the confidence level was 1.96 (95%), the data collected through the questionnaire is made up of 32 questions in a Likert scale and 9 general multiple-choice questions on sociodemographic data. As a general result, an 83.76% quality of university life was obtained in students from the South of Sonora. In the general data obtained, 57.8% belong to the female sex and 41.7% to the male sex, with 0.5% identifying as non-binary, 60.5% corresponding to the age range between 18-20 years, 34.7% corresponds to the age range of 21-23 years, 2.2% is 27 years old, 1.6% corresponds to the age range of 24-26 years, 1.1% is less than 17 years old, 91.1% of the participants are single, 6.5% have a different marital status, while 2.4% are married.

### Cross-Sectional Research, Trust And Quality Of Life

## **A descriptive study about language anxiety while learning English as a second language**

### **Un estudio descriptivo sobre la ansiedad del lenguaje al estudiar inglés como segundo idioma**

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#### **Abstract**

Learning a second language has implications that go beyond cognitive processes. External factors such as the individual's economic situation, and other intrinsic factors such as motivation, can influence the second language acquisition. With this study we seek to analyze the role anxiety can have in order to learn English as a foreign language. This work is based on a descriptive analysis which was applied to 1773 undergraduate students from a University of Guadalajara campus, and with this study we look forward obtaining information about the role of anxiety in learning English; in addition to identifying whether there are any differences in anxiety levels according to the major students are going to graduate from. It is intended to contribute to the knowledge related to the study of a second language, to determine what factors influence the development of language anxiety, and how it could be possible to work aiming to reduce it while ensuring that the students can learn a second language in a more effective and meaningful way.

**Learning Process, Foreign Language, University Students**

## **Assertive communication in the Japanese language through internationalization experiences for Technological University of Leon Students**

### **La comunicación asertiva en lengua japonesa a través de las experiencias de internacionalización de los alumnos de la Universidad Tecnológica de León**

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#### **Abstract**

Every culture represents a long-time historical process result that strengthens each strain and characteristic of individuals. The Mexican culture has typical characteristics such as kindness, funny, and not-so-serious in some other aspects. Nevertheless, the Japanese culture is very different. Influenced by ideas like honor, obligations, and duty. These characteristics are known as “Giri”. Manners are completely different from Western countries' ideas, where you can find more liberal and individualistic cultures. An important element of the Japanese culture is the language. It is because it represents their culture, religion, ethics, and their particular humor sense. This is why it is considered difficult to completely interpret it by other cultures. Currently, the Japanese language is the world's 9th most spoken language with an approximated amount of 127 million speakers, therefore, understanding the language will let us understand Japanese culture in a better way. Considering the context explained above, this document has an objective: Strengthen the student's knowledge and make aware them of the proper use of the Japanese language, Japanese manners, and its traditions. Approaching the students to these scenarios by applying assertive communication through internationalization experiences.

#### **Japanese, Communication, Internationalization**

## **Social Work intervention in health conditions and promotion of family integration in a walker in Poza Rica**

### **Intervención de Trabajo Social en las condiciones de salud y promoción de la integración familiar en un andador en Poza Rica**

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#### **Abstract**

The Social Work intervention strengthens the promotion of health, education and the adoption of self-care practices, for which a professional intervention was carried out in a walker, with the objectives of promoting comprehensive health in families and promoting the training of students. The methodology used was participatory action research: 1) Diagnosis and 2) Intervention. The results of the diagnosis indicated that the age of the attendees between 45 and 71 years, 91% come to exercise for physical health, the main activities carried out are walking and jogging, 50% suffer from some chronic disease; Finally, they expressed interest in conferences, talks, size and weight controls, and activities for the family. The Professional intervention had as results: socio-educational activities that favor family integration, healthy coexistence, strengthening of values and physical activities for the benefit of health, with 150 people; a cycle of conferences on self-esteem, stress management and eating habits with 75 people; Likewise, 6 students participated in the design and execution of the project, developing skills for working with groups and families, as well as in the application of techniques for social intervention, strengthening professional training as social workers in real settings.

#### **Diagnosis, Intervention, Execution**

## **The creation of oneself in free time: educating for leisure**

### **La creación de sí en el tiempo libre: educar para el ocio**

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#### **Abstract**

The building of itself is an act moved from the hopes and dreams of becoming. Dreams project a future that can be, and hope is the force required to achieve them. The life project is an exercise in awareness that begins with imagining what you want to be and be aware of the relationship with the world. Leisure is lived from internal motivations and is auto-condicionated to seek the opportunities realization of dreams. Education for Leisure must recover the ideals of life, learning to live the leisure, and spark the imagination for the realization of dreams. This paper presents the research results on what you want to be and how to realize them in their free time; this is a descriptive case study investigation with the phenomenological method.

**Leisure, Self-creation, Imagination, Dreams, Hope**

## **Changes in control of supplies, production processes and advertising of Acámbaro companies; Gto. Derived from the pandemic**

### **Cambios en control de suministros, procesos productivos y publicidad de las empresas de Acámbaro; Gto. Derivado de la pandemia**

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#### **Abstract**

Changes are undoubtedly part of our environment, thus, the COVID 19 pandemic marked a milestone in terms of the way in which companies in the productive sector raise and execute their activities. This article shows how the productive sector has reacted to the new needs that have arisen, as well as the strategies implemented and the acceptance of new methodologies and actions to continue subsisting. With the information presented, it is possible to make conjectures and estimates regarding the changes that are currently used by most companies and that allows them to remain in the competitive market, in addition, the various aspects mainly considered and their comparison of implementation both in the field of supplies, production and advertising are appreciated.

**Companies, Supplies, Production, Advertising, Strategy, Changes, Pandemic, Methodologies**

## **Export of vegetables in the Rural Development District of Tecamachalco, Puebla, within the framework of the USMCA**

### **Exportación de hortalizas en el Distrito de Desarrollo Rural, Tecamachalco Puebla, en el marco del T-MEC**

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### **Abstract**

This research addresses the problems faced by exporters of vegetables in the Rural Development District of Tecamachalco, Puebla. In the international framework of the USMCA, the marketing process is complicated due to the certification of the products that have to be regularized for export through SENASICA, HACCP, and PRIMUS LAB, whose marketing channels have been established through intermediaries, so it has created a disparity between the producer and the final consumer. The nationwide marketing chain has been identified in three supply centers: Huixcolotla, the City of Puebla, and Iztapalapa, in CDMX, in addition to municipal markets and local flea markets. Also, it was identified that the most important means of international marketing is through land transport, and the main border cities are: Tijuana, Nuevo Laredo, Matamoros, Mexicali, Nogales, and Ciudad Juárez. Finally, the fieldwork was carried out with producers of the region in the municipalities of Tecamachalco, Acatzingo, Tochtepec, Tlacotepec, Tepeaca, and Huixcolotla, where a sample of 185 producers was applied through a questionnaire, which was used as an instrument in the regional level survey.

### **Export, Vegetables, Intermediary, Commercialization, and Border**



## Science Education using Kaanbale Virtual Reality

### Enseñanza de las Ciencias utilizando Kaanbale Realidad Virtual

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### Abstract

Virtual Reality (VR) is an emerging technology that has gained a significant role in the instruction of science because in contrast to text and face to face learning, has a positive impact on their contents learning, generating positive emotions for comprehending physics concepts. Kaanbale is a Virtual Reality system designed with Kanban and MeISE methodologies that provides an captivating and immersive experience for students and allows them to view and understand science subjects and topics through a personal virtual environment. The concept used in this work was Uniform Motion, which is defined as the motion of an object in which the object travels in a straight line and its velocity remains constant along that line as it covers equal distances in equal intervals of time, irrespective of the duration of the time; but through Kaanbale is possible simulate other physics motion concepts like uniformly acceleration, parabolic and free-fall. This paper intends to demonstrate that the immersion and engagement that high school students gain from Kaanbale VR significantly enhances their ability to understand and retain information.

**Virtual Reality, Simulator, Emerging Technology**

## **Resistance to digital change, a factor that affects learning and impacts the academic performance of the university student**

## **Resistencia al cambio digital factor que afecta el aprendizaje e impacta en el rendimiento escolar del universitario**

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### **Abstract**

The mission of the university institution is to create an optimal learning environment, guiding the student to develop skills, competencies and attitudes complementary to the mastery of the specific knowledge of the different subjects; this not only depends on the vision that the teacher and the educational institution have about education, it must innovate in teaching-learning methods, change the paradigms in psychopedagogy according to the disciplinary field in question; adapt the digital competencies that are essential in the context of an educational management that involves knowledge and skills that can be significant. Education is a phenomenon in which individual and social variables are related, involving the change towards digitalization, emphasizing the participation and motivation of the student, to develop professional competences in a global way, which will allow him/her to adapt to new situations and to the achievement of personal and work objectives. The objective of this research is to determine the factors that cause resistance to digital change that affect their learning and impact their school performance. The research approach is quantitative, and the type of research is cross-sectional descriptive.

**Digitization, Teaching-Learning, School Performance, Innovation**

## **Influence of motivation and job satisfaction on job performance in Mexican industrial microenterprises**

## **Influencia de la motivación y la satisfacción laboral en el desempeño laboral en microempresas industriales mexicanas**

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### **Abstract**

The main objective of this paper is to analyze the relationship between motivation variables and job satisfaction in job performance. The hypothesis of this study is that there is a relationship between motivation and job satisfaction with job performance. This study has a quantitative approach, with a descriptive, correlational and explanatory scope. The design is non-experimental and cross-sectional. The object of study are industrial companies with less than 10 workers in a municipality in the south of the state of Sonora in Mexico. The subject of study were the workers of the operational areas of said companies. An instrument with a Likert-type scale was designed, which was submitted to statistical tests to determine its validity and reliability. One contribution is that only one investigation was found regarding small and medium-sized companies in which job satisfaction is positively related to the performance of workers, which was carried out by Soomro and Shah (2019). No one made in Mexico was found.

**Motivation, Job Satisfaction, Job Performance, Industrial, Municipality**

## **Nursing teaching development, from the perspective of university students**

### **El desarrollo de la enseñanza de enfermería, en la perspectiva de los estudiantes universitarios**

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### **Abstract**

The training of professionals focuses on a one-dimensional and pragmatic perspective, with attitudes such as constructive criticism of what happens in reality, the panorama of university teaching, conceived as the transmission of contents or the formation of competences, on the practice based on the reality in which the transformation represents the new social environment. Objective: To understand the perception that university students have regarding the development of teaching in the Nursing Degree at the Universidad Autónoma Metropolitana-Xochimilco. Methodology: Descriptive study, with a representative sample of nursing students from the 5th quarter of the Universidad Autónoma Metropolitana. The statistical analysis was carried out through SPSS 21. Contribution: This article will allow universities to have a perspective of the teaching that is taught, the strengths, weaknesses and areas of opportunity, to improve the quality of teaching-learning, training professionals capable of facing the problems of the Mexican reality.

### **Nursing, University Students, Teaching**

## **Perception of academic training and job placement of graduates of the nursing degree UAM-X**

### **Percepción sobre la formación académica e inserción laboral de los egresados de la licenciatura en enfermería UAM-X**

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#### **Abstract**

Currently, the training of professionals focuses on a one-dimensional and pragmatic perspective, with attitudes such as constructive criticism of what happens in reality, committed to improving processes and practices in an aspect that begins mainly focused on scientific development. and technological, becoming more and more a value and a necessity for the progress and improvement of individuals and societies, for which there is a broad consensus that the main function of universities is the production, dissemination and preservation of knowledge systematically. Objective: To analyze the perception of the graduates of the nursing degree from the Universidad Autónoma Metropolitana - Xochimilco, their academic training and job placement. Methodology: Descriptive-analytical study, with a representative sample of nursing graduates. The instrument used was designed The keywords are required in Spanish and English., based on the investigations of Pérez CV: "Follow-up of graduates of the nursing degree (2008)" and Gómez, et al. "Satisfaction model of university graduates (2019)". Contribution: Knowing the academic training and how graduates enter the labor market allows universities to assess whether their teaching processes contribute satisfactorily so that graduating students, not only in nursing but also in any career, They provide the attitudes, aptitudes and strengths

#### **Nursing, Graduates, Job Placement**

## **Conclusions and proposals as fundamental part of the thesis research**

### **Las conclusiones y propuesta de tesis como parte esencial de la investigación**

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#### **Abstract**

This essay analyzes the importance of conclusions and research proposals in thesis research, analyzing comments by other authors about doing a thesis. Taking into account experience by the author as teacher, researchear and research evaluator.

## **Digital Violence in a Higher Education Institution.**

### **Violencia Digital en una Institución de Educación Superior**

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#### **Abstract**

Digital violence is a reality both in the global, national and local context. In different areas, including the Institutional, as is the case of Higher Education institutions. So, in order to know the presence and types of violence that are manifested through digital media in university spaces, it is relevant and urgent to carry out a diagnostic study at ITSON. The objective is to know the presence of the types of violence that are manifested through digital media in university spaces in students of the Administrative Economic DES. The research carried out is an exploratory and quantitative study. The selected technique was the survey and the elaborated instrument was an ad hoc questionnaire of 35 questions, in order to measure the degree of incidence of digital violence through a survey and the analysis of results through the statistical method, using probabilistic sampling. Contributing to influence the university community in the prevention and action of digital violence through institutional measures and policies aimed at raising awareness, training and training of all members.

#### **Violence, Digital and education**

## **Organizational Performance Improvements through the Design of Internal Controls, Accounting Records and Determination of Unit Production Costs in Industrial SMEs of Transformation, Service and Assembly**

### **Mejoras del Desempeño Organizacional mediante el Diseño de Controles internos, Registros contables y Determinación de los Costos Unitarios de Producción en las Pymes Industriales de Transformación, Servicio y Montaje**

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#### **Abstract**

Organizations nowadays need to improve their performance, which is why it is necessary to have all the elements that are part of their administration, especially in the financial area. These SMEs (industrial processing, service and assembly) that have been investigated were found to lack financial information in relation to their production costs and support in terms of internal control elements, accounting records, as well as the calculation of return on investment and recovery of the same, which is achieved through the sale price of products and services offered. The small and medium-sized enterprises (SMEs) that were investigated and derived from their problems, the objective of this study is to show the improvements that they established for each participating entity and the recommendations suggested at the end of the project as a way to improve their performance suggested at the end of the project as a contribution to this research. The methodology suggested in the participating economic entities, following a description of them, in a period of time and by convenience sample and the application of a procedure consisting of a series of several four stages: analysis of financial data, improvement of internal control of operations, accounting records and determination of unit cost and % of profitability. Contributing in this inquiry this series of procedure and carrying it out, gives the certainty of contributing to a better performance of each one of the organizations and allowing with it to generate valuable financial information and profitability with percentage analysis.

**Internal Controls, Accounting Records, Unit Costing, Unit Costing**



## **Validation of a pulp-type candy (Pulpijamay) based on the by-product of the hibiscus flower (*Hibiscus sabdariffa*)**

## **Validación de un dulce tipo pulpa (Pulpijamay) a base del subproducto de la flor de jamaica (*Hibiscus sabdariffa*)**

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### **Abstract**

There is a diversity of sweets in confectionery according to times and countries, according to regions and religions where there is no limitation in the preparation of the sweet depending on the imagination of each confectioner. With the jamaica flower (*Hibiscus sabdariffa*) various food products are made and currently with pharmaceutical interest, certain products are attributed beneficial qualities in weight loss, favoring the digestive process in a good way, it is slightly laxative and is also diuretic, reason for which it has cleansing and detoxifying effects, despite these benefits, in general only the supernatant is used and the flower is discarded as organic waste. Therefore, in the present research work, it seeks the use of the pulp of the jamaican flower (*Hibiscus sabdariffa*) developing a sweet, carrying out tests with different binding substances and concentrations, obtaining samples of paste to later be mixed with sucrose, salt and chili pequin. The same procedure was carried out for gum arabic, glucose and the glucose-sucrose mixture. Physicochemical results were obtained from the product, such as pH, °Brix and the desired viscosity for the Jamaica flower candy.

### **Flor De Jamaica, Sweet And By-Product**

## Oversight and public finances in Mexico

### Fiscalización y finanzas públicas en México

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#### Abstract

The general objective of the research is to describe the impact of audit management on public finances and tax revenues. According to Organization for Economic Development Cooperation (OCDE, 2022), Mexico lags behind other countries in terms of tax revenue, and tax evasion is considered one of the factors that contribute to this situation. Evasion makes it possible to hide profits and avoid paying the corresponding taxes, which affects state finances and limits the government's ability to promote social programs and improvements. Fiscal policy is a fundamental tool for the economic development and financial stability of a country. In this context, an explanatory qualitative methodology was used, which generated evidence to conclude that auditing acts in Mexico have allowed an increase in tax revenues with a positive effect on public finances; however, still below the average collected by member countries of the OCDE. It is proposed to improve tax education by providing information on the rights and obligations of taxpayers and greater transparency informing how the proceeds are invested and training businessmen in the use of technologies to facilitate the payment of taxes.

**Fiscal, Audit, Income**

## **Analysis of Financial Education in university students from a university in Southern Sonora**

### **Análisis de Educación Financiera en estudiantes universitario de una universidad del sur de Sonora**

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### **Abstract**

Talking about financial education today is more common, credits, exchange rates, solvency, liquidity are terms that people of adulthood often use, this research was carried out with students from a public University in the South of the State de Sonora specifically with the students of Industrial and Systems Engineering, an instrument was applied to them that is composed of 52 items that include 36 multiple choice questions, 8 about their opinions and decisions and 8 questions about sociodemographic data, it was applied to a sample of 170 subjects. The results with the greatest impact, it was found that the level of financial education is low, that the youngest subjects and those who have never worked have a lower level than those who have been part of the population economically for more years active, women denoted a lower level of financial literacy and the category with the lowest score was the one that has to do with investments

### **Financial Education, College Students, Investments**

## **Evaluation of organizational behavior in the personnel of Micro and small companies in the city of Izúcar de Matamoros**

### **Evaluación del Comportamiento organizacional en el personal de las Micro y pequeñas empresas de la ciudad de Izúcar de Matamoros**

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### **Abstract**

The Micro and small companies of the city of Izúcar de Matamoros, have suffered great effects for various reasons, through university intervention we want to evaluate the impact of not carrying out an analysis of organizational behavior. According to the above, the interest of evaluating the organizational behavior of the market dedicated to the purchase and sale of tangible goods and helping to improve the areas of opportunity that may arise, likewise, to be able to strengthen the company and contribute to its permanence. In the market. It is considered important to mention that one of the reasons for this research is to help and provide greater knowledge of the organizational culture and organizational climate and how they influence the behavior of staff and their job performance. It is considered essential to involve the senior management of MSMEs, because they must have knowledge about the behavior of this phenomenon, that is, the relationship between culture, climate and behavior in performance, labor productivity of employees. Collaborators in the economic entities of the center of Izúcar de Matamoros, Pue.

### **Assessment, Organizational Behavior and personal**

## **Panorama on competitiveness, financing capacities and training of personnel in companies of the Food sector dedicated to the production of dairy products in Cajeme, Sonora**

### **Panorama sobre competitividad, las capacidades de financiamiento y capacitación del personal en empresas del sector Alimentos dedicadas a la producción de productos lácteos en Cajeme, Sonora**

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### **Abstract**

**Objetive** The objective of this research is to visualize the panorama on competitiveness, the financing capacities and training of personnel in companies in the food sector dedicated to the production of dairy products in the municipality of Cajeme for the detection of areas of opportunity that increase their possibilities of permanence in the market. **Methodology** The research to be carried out is of a mixed nature, that is, it requires descriptive statistics for the qualitative results and inferential statistics for the correlation of the variables. The structural equations method is used with the SMART PLS4 software. The independent variables (financing capacities and personnel training) and the dependent variable (competitiveness) are established. The instrument used was adapted from the INEGI 2018 National Survey on Productivity and Competitiveness of Companies. **Contribution** Statistically significant evidence was found that access to financing and receiving training to improve staff performance increase the competitiveness of companies. The variable of access to financing being more significant than that of training.

### **Competitiveness, Financing Capacities, Training**

## **Evaluation of the degree of social responsibility in micro and small businesses in the food service sector**

### **Evaluación del grado de responsabilidad social en micro y pequeñas empresas del sector servicio de alimentos**

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### **Abstract**

The objective of this study was to evaluate the degree of social responsibility in micro and small companies in the food service sector. The evaluations were applied to 63 fixed establishments dedicated to the preparation, sale and consumption of food, distributed in eight municipalities of the state of Jalisco, Mexico, which were grouped according to the categories established in the North American Industrial Classification System. A single visit survey was applied to each establishment. The Corporate Social Responsibility index was applied to the results. 6.3 % of the establishments were Socially Responsible, 54 % moderately responsible and 39.7 % as not responsible. The last two ones have elements of Corporate Social Responsibility, but not as structured programs. It contributes to obtain a deeper understanding of the problems involved in trying to apply a sustainable administrative management to accommodate a system of social responsibility, which supports and records the decisions that are being made in the company from this perspective, in order to plan successful intervention strategies.

**Business Ethics, Restaurants, Socially Responsible Management**

## Technology transfer through the development of a system for teacher evaluation

### Transferencia tecnológica mediante el desarrollo de un sistema para la evaluación docente

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### Abstract

This research is carried out at the School Normal Official (ENOI) for the Research area in charge of collecting and managing the data resulting from the evaluation of teachers. Currently, this department does not have a specialized software system for this process (it is carried out manually), for these third-party technologies are used, which are Google Forms and Microsoft Excel. Due to this, a large number of failures have occurred in the process, among the most frequent those related to the integrity, consistency and redundancy of the data. This results in a considerable loss of time, taking into account that the institution has 66 professors and for each one 2 documents are generated (1 Excel and 1 Word), in addition to 4 more spreadsheet documents to carry out the analysis. of the data and finally 4 documents for presentation of the results. Giving a total of 140 documents to be generated only by a single person. Taking these data, it is essential to manage the information, this allows to meet the needs of the institution in the shortest possible time, allowing strategies and work plans for the academic area to be carried out. ICTs give us the opportunity to create, modify and store information. Its development has evolved along with society, knowledge and education, allowing access to information at any time. The objective of this project is to develop an information system as a support tool to improve evaluation processes and provide a follow-up of teachers visualizing their academic work.

### Process of Evaluation, Administration, Software

## **Analysis of shrinkage loss, retail sales company "tienda y cremería Toni"**

### **Análisis de pérdida por merma, de venta al detalle empresa "Tienda y cremería Toni"**

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### **Abstract**

In this paper is analyzed that a company's inventory is a non-monetary asset that represents the financial engine for the cash flow necessary for its operation, therefore, everything that directly affects it must be detected, corrected and supervised. Everything starts from its order to its reflection in the results or profits. That is why in this paper the analysis of the main causes that originate the loss in the inventory due to the loss or deterioration of the products in a company that sells to the general public due to the displacement, packaging, handling and expiration, identifying the degree of percentage impact on sales, by type of product, as well as the circumstances in which the staff causes them when it is related to inventory logistics, the customers themselves and also the causes in that the suppliers that supply the products affect their deterioration. The method for the investigation is mixed since it contains qualitative and quantitative aspects identified through the sources that have previously developed the subject and in the operational field of the company to finally obtain the impact that it causes to the utility of the company.

### **Shrinkage, Inventory, Loss, Financial**



## **AST for the Development of Professional Competencies in Software Engineering**

### **AST para el Desarrollo de Competencias Profesionales en Ingeniería de Software**

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#### **Abstract**

This work shows the results of the implementation of the Work Situational Analysis, focused on the Computer Engineering Educational Programs of the University of Guadalajara, specifically on the competencies of the Software Engineering learning unit. The main objective is to identify the professional and transversal competences that, according to the industry, the graduates of these programs must comply; as well as to identify to what extent work is being done academically to achieve these competencies. It was found that it is necessary to update the Software Engineering program through collegiate work in order to establish strategies to achieve the development of personal skills and attitudes that, according to industry participants, these skills are as important as the professionals skills.

#### **Competences, Habilities, Job Situation Analysis**

## **Administrative and financial diagnosis of miscellaneous stores classified as microenterprises in Izúcar de Matamoros, Puebla**

### **Diagnóstico administrativo y financiero de las tiendas misceláneas clasificadas como microempresas, de izúcar de Matamoros, Puebla**

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#### **Abstract**

This investigation has the purpose of carrying out an administrative and financial diagnosis of the miscellaneous stores classified as microenterprises, (MIPYMES) especially in the center of the H. Ayuntamiento de Izúcar de Matamoros, Puebla, to know the strengths and weaknesses faced by those negotiation entities commercial, industrial and service, which will help propose solutions that allow them to improve their current conditions, the organizational structure of the microenterprise. To carry out the case study, it was obtained from a sample that represents, according to the design, the stratified probabilistic sampling in strategic populations of the center and its nearby towns of the H. Ayuntamiento de Izucar de Matamoros, for which the measurement instrument made up of administrative indications, accounting, financial and tax was through a direct questionnaire with a Likert-type scale, considering the trade and service sectors. The result of the investigation shows that the MIPYMES, of the H. Ayuntamiento de Izucar de Matamoros, coexist and subsist despite the fact that all administrative, accounting and financial control are empirical; However, they also emphasize its important strengths and its characteristics, of which the Mixtec region of Puebla belongs

#### **Msmes, Financial And Administrative Diagnostics**

## **Methodological proposal for the transfer of industrial manufacturing processes in a transnational firm: a China-Mexico particular case**

### **Propuesta metodológica para la transferencia de procesos de manufactura industrial en una firma transnacional: un caso particular China-México**

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#### **Abstract**

This paper addresses the problem of the transfer of international production processes in the manufacturing industry and proposes a methodology to identify the essential activities required for it. The bibliographical research reveals the problems associated with the lack of an objective methodology in the management of projects for the transfer of processes between countries. In order to solve this problem and in the absence of a specific methodology, a case study was developed, based on the transfer of the Zoned Amplified production line of the Carrier company, from China to Mexico. In order to obtain a solid and complete methodology, different authors and proposed approaches for manufacturing transfers were compared, collecting the relevant information. As a result, a methodology composed of seven steps is proposed, either: factors for implementation, initiation of transfer documentation, design of the transfer plan, design for manufacturing, technology transfer and installation requirements, validation process and, finally, launch. This contributes to the industry in general, a practical and effective guide to address international process transfer projects, associated with specific standards in some cases, thereby overcoming the associated challenges and guaranteeing success in their execution.

**Manufacturing processes, International transfer, APQP, Methodology for process transfer**

## **Applying electronical devices to save electrical**

### **Auditoria energética a un campus universitario**

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### **Abstract**

Saving energy and improving energy efficiency are important challenges that must be faced in the short term. Any company, industrial or service, must consider whether their facilities and processes respond to an optimized design from the energy point of view. Appropriate energy management leads to the efficient use of energy and, consequently, the reduction of energy costs. An energy audit should be part of the energy efficiency programs or plans of any company, as well as any educational institute that wishes to do so. These plans must include those actions aimed at achieving maximum efficiency in energy consumption, maximum savings and knowledge of the energy behavior of their facilities. The objective of this document is to carry out an energy audit in a Higher Education School located in the City of Linares, Nuevo León. Said audit can serve as a model for carrying out energy audits in other types of institutions.

### **Audit, Energy, Savings**

## **Innovation and digital transformation index in the use of information and communication technologies in the management of Micro, Small and Medium Enterprises in the city of Xalapa, state of Veracruz of Mexico**

### **Índice de innovación y transformación digital en la utilización de las tecnologías de información y comunicación en la gestión de las Micro, Pequeñas y Medianas Empresas en la ciudad de Xalapa, estado de Veracruz de México**

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#### **Abstract**

The general objective of the research is to identify the rate of innovation and digital transformation that Micro, Small and Medium Enterprises (MIPYMES) currently have with the use of information and communication technologies (TIC's). We believe that after what happened to all organizations and companies with the COVID19 pandemic and the return to a new reality of organizing, operating, managing and directing companies, it is necessary for the personnel of the different hierarchical levels to get involved with the use and mastery of information and communication technologies. The following questions help us to establish our hypothesis: Does the use of TIC's in the organization influence decision-making at the management level? Is the age of the managers or owners of MYPYMES related to the use of TIC's in the organization? Our study has a quantitative and qualitative approach; we will look at various pertinent data on variables and contexts in the study. For all of the above, we are interested in carrying out this research on MYPYMES since they represent a high impact on the economy of the city and if there is any relationship between innovation and business well-being.

**Innovation, Digital Transformation And Information And Communication Technologies**

## **Identify the Most Effective Method of Competitive Small Businesses**

### **Identificar el Método más Efectivo de Pequeñas Empresas Competitivas**

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### **Abstract**

The main objective of the study is to identify the most effective method that makes a company competitive. Exploratory and descriptive research was carried out based on a mixed, qualitative research scheme with documented foundations of descriptive type, observation, interviews, elaboration of an instrument applying a sample of 75 surveys to managers or owners of small companies of different segments, with a confidence level of 95% and a margin of error of 5%, using a quantitative approach for the analysis of the most effective strategies axes. The results indicate that good practices show an effective relationship with competitiveness and that the implementation of the strategies will improve them.

### **Competitiveness, Method, Strategies**

## **Analysis of the Simplified Trust Regime RESICO**

### **Análisis del Régimen Simplificado de Confianza RESICO**

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### **Abstract**

Individuals and legal entities acquire tax obligations when they start an economic activity. The obligation of individuals and legal entities to contribute to public spending is established in the Federal Tax Code in its Article 1, where the provisions that apply are indicated; It is the main foundation of the contributions classified in taxes, social security contributions, contributions of improvements and rights, mentioned in Article 2 of the CFF. Complying in a timely manner with the payment of the respective contributions, avoids being a creditor to certain tax credits, updates and surcharges. The SAT continually seeks ways for taxpayers to comply with said obligations, adapting tax regimes that facilitate this process. The RESICO Simplified Trust Regime is an example of this, where it is established who can and cannot pay taxes, the requirements and procedures to comply with tax obligations. In this analysis, we contribute to the generation of knowledge about the scope of this new tax regime.

### **Tax Regime, Taxes, Contributions**

## **Simulated operations. An analysis of their treatment and tax impact**

### **Las operaciones simuladas. Un análisis de su tratamiento e impacto fiscal**

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### **Abstract**

According to the Taxpayer Defense Attorney (PRODECON), the issuance and improper use of tax receipts has been a matter of great concern for the Mexican tax authorities, since, at the moment when some taxpayers incur in this bad This practice affects the interests not only of the public treasury, but of society in general as revenue collection is reduced, since it must be remembered that according to article 31, section IV of the Political Constitution of the United Mexican States, "it is the obligation of the governed contribute proportionally and equitably to the public expenses of the Federation, the States, Mexico City and the Municipality in which they reside". The improper use of tax receipts motivated the reform to the Federal Tax Code (CFF), to add article 69-B, which seeks to combat this malpractice of some taxpayers, establishing in said legal system the cases in which the tax authority must consider the presumption of non-existence of operations covered by Vouchers

### **CFDI EFO EDO Simulation**



## **Professionals in the position of purchasing administration in companies in Ciudad Obregón**

### **Profesionistas en el puesto de administración de compras en empresas de Ciudad Obregón**

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#### **Abstract**

This research work shows us the profile of the personnel that is occupying the position of responsible for the purchasing function in the companies of Ciudad Obregón. The investigation was carried out in 54 companies that agreed to provide information in this regard. To obtain the information, an instrument was used that allowed the information to be obtained immediately on the type of professional or academic profile of the person who occupies the purchasing position in the company. Regarding the results of this investigation, it is observed that 24.54% of the companies do not have a purchasing position, 26.41% have a person who is in charge of purchasing responsibility in addition to other functions different from it and 49.05 do. have a purchasing manager with some profession, of which 46.15 are graduates in administration, 23.07 are public accountants, 7.69% are industrial engineers, 7.68% are graduates in commerce and business, and 7.68% are graduates in law and electricians. In conclusion, there is no clarity regarding the academic profile that the person must have to fill the purchasing position.

#### **Purchasing, Job Profile, Skills**

## **Educating to Innovate: Designing Public Policies Aligned with Sustainable Development Goals (SDGs) in Guanajuato State**

### **Educación para la Innovación: Diseño de una política pública alineada a los Objetivos de Desarrollo Sostenible (ODS) en el estado de Guanajuato**

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### **Abstract**

A documentary research is presented that has the purpose of explaining the relationship that exists among the educational systems of a region, with the development of a regional innovation and entrepreneurship ecosystem, in order to propose guidelines in public policy that affect the achievement of the Sustainable Development Goals (SDGs) related to Quality Education (SDG 4) as well as Industry, Innovation and Infrastructure (SDG 9). The results show that a key indicator related to these two SDG objectives is school dropout; and to the extent that this phenomenon can be reduced, significant progress can be made towards achieving these aspirations expressed from the United Nations (UN). The study focuses on the Guanajuato case study, which is a political demarcation located in the central region of Mexico. Based on a comparative analysis when applying public policies based on flexible education in other regions of Latin America, together with the principles of participatory governance, a possible way to reduce the school dropout rate, which affects the achievement of SDGs 4 and 9, is proposed to achieve a better quality of life in the state of Guanajuato.

**Innovation, Quality of life, Flexible education**

## **Social skills identified with areas of opportunity in the student body of the Technological University of León**

### **Habilidades sociales identificadas con áreas de oportunidad en el estudiantado de la Universidad Tecnológica de León**

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#### **Abstract**

The present investigation helped to identify the social skills that need to be reinforced in the students of the period January-April 2023 of the Technological University of León, (UTL) through the Goldstein evaluation instrument, with responses on the Likert scale. The survey was adapted in the UTL Virtual Classroom and applied to 2,394 students representing 70% of the TSU level population. The analysis of the skills with the lowest score was carried out by crossing the information with the career, after which the general analysis of each skill was carried out with respect to the sociodemographic data. The skills and careers that require further reinforcement were identified. The results contribute to the subsequent design of strategies that help students to improve in all skills, emphasizing the lowest ones. Other investigations in this regard were analyzed, resulting in similarities in the behavior of the student body according to the age or stage they are living.

#### **Social Skills, Feelings, Student Body**

## Academic Resilience in Higher Education

### Resiliencia Académica en la Educación Superior

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### Abstract

The coronavirus disease (COVID-19) caused a worldwide pandemic and a catastrophic quarantine for all humanity for which very few were prepared, this event caused many people, especially young students, a level of stress to which many were not accustomed, which generated serious physical and psychological problems as it completely changed the routine that in the case of most university students have been doing for more than 15 years. Students had to face the loss of their families, friends and close people, others less fortunate had to face the loss of their jobs, which caused a considerable number of students in Mexico and worldwide to drop out of school. The main purpose of the research consisted of finding out the perception of university students during the context of COVID 19 and the strategies they implemented to resolve the different situations they faced academically, as well as the strategies they implemented to resolve the situations they faced academically, and strategies they used to adapt to the new normality. The main purpose of the research consisted of finding out the perception of university students during the context of COVID 19 and the strategies they implemented to resolve the different situations they faced academically, as well as the strategies they used to adapt to the new normality. The method used was the hypothetical deductive method, and the study was exploratory. The sample consisted of 351 students from the Universidad Tecnológica de León (UTL), who responded to an online form. In the results obtained, apathy and little or no awareness of the importance of their learning were identified in their responses, regardless of the pandemic factor, which, although it is a relevant factor, and which showed the students' areas of opportunity, it is not the only one. This study identifies academic resilience as an element to be considered as a milestone for innovation in university educational processes, as well as the impetus for optimal academic development, the implementation of learning communities in educational institutions.

**Academic Resilience, University Students, Adaptation, Higher Education**

## **Culture moderates the intention to purchase tourist accommodation online**

### **La cultura modera la intención de compra en línea de alojamiento turístico**

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### **Abstract**

The origin of the models of culture in electronic commerce is aimed at explaining the factors that influence the acceptance of this purchasing system, which is why they contemplate cultural differences of the consumer according to their nationality. Therefore, this research analyzed studies that have implicit models with moderating effects applied by Hofstede, (1980) *cultural values*. A questionnaire was administered to 500 buyers of tourist accommodation. Carrying out a descriptive study of the sociodemographic variables with the purpose of verifying the moderating effect of culture, a Multigroup Analysis -AMG-. Subsequently proceeding to contrast the structural model from the three antecedents raised theoretically -attitude, subjective norm and perceived control- which turned out to have a direct impact on the purchase intention.

### **Attitude, Subjective Norm, Perceived Control**

## **Migration, vulnerability and resilience. Story and life history as narrative tools in social work**

### **Migración, vulnerabilidad y resiliencia. Relato e Historia de vida como herramientas narrativas en el trabajo social**

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### **Abstract**

This paper aims to intertwine the history of life as a technique within social work, to talk about family migration that goes from a Totonac town to the north of the Mexican Republic. The phenomenon of migration is generally associated with heartbreaking and sad stories. In this case, memory and life history go hand in hand to talk about the youthful subjective experience of effort, commitment, achievements, but also problems, illness, and the forced path towards resilience. With the use of qualitative methodology and specifically from narrative techniques, it presents us with another way of expressing the problem of youth migration. The narrative becomes, then, an example of how social research techniques come together to expose a daily experience of mobility, making it a reason for interdisciplinary study of social work with anthropology, under the auspices of hermeneutics.

### **Narrative Techniques, Youth, Migration**

## **Monthly Workshops: The Importance of Practice in the Professional Development of Students**

### **Las Mañanas de Trabajo: La Importancia de la Práctica en el Desarrollo Profesional de los Estudiantes**

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#### **Abstract**

This article aims to explain the importance of practical experience in the professional development of students of the Higher Technician of the English Language program, from the Universidad Tecnológica Cadereyta, in Nuevo Leon, through a monthly activity called "Mañanas de trabajo". As a result, this activity has favored the strengthening and integration of the skills and competencies promoted by the study plan, in the professional training of the students of the career, especially in the teaching of the English language; furthermore, "Mañanas de trabajo" has allowed the interaction of university students with schoolchildren of the different levels of basic education, through various activities that are carried out throughout this monthly exercise in the classrooms and various spaces on the university campus. Therefore, the importance of meaningful learning is considered, through the different practices that are generated, above all, the impact on the integral formation of students in the educational area.

#### **Teaching, Meaningful Learning, Practices**

## Optimization in the Warehouse Area Through the 5S Methodology

### Optimización en el Área de Almacén Mediante la Metodología 5S

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#### Abstract

Goals Optimize the company's warehouse area using the 5S methodology. Reduce to the maximum, the time wasted in search of the necessary tools when carrying out any type of work. Increase the space or useful area in the company's warehouse. Keep existing material and the right tools in the right place. Methodology The qualitative approach of the 5S method involves the observation and detailed analysis of processes and work spaces to identify opportunities for improvement in terms of organization and cleanliness. It is a methodology that seeks to understand the user experience and how it relates to their work environment, in order to design solutions that suit their needs. The qualitative approach of the 5S method seeks to improve the quality of life and satisfaction of workers, which in turn can have a positive impact on productivity. Investigation What is the 5S methodology? What is the impact of good warehouse management within a company? Contribution It was possible to organize and assign a space for each tool, obtaining with this the reduction of time in the search for tools and materials in the warehouse area.

**5s Methodology, Warehouse, Quality**



## **Implementation of the Organizational Culture in the Paletería la Michoacana**

### **Implementación de la Cultura Organizacional en la Paletería la Michoacana**

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#### **Abstract**

The study of organizational culture Specifically, organizational culture includes: Routine ways of communicating, such as organizational rituals and ceremonies and common language; the standards shared by individuals and teams across the organization; the dominant values held by the organization; the philosophy that regulates the policies and decision-making of the organization; the rules of the game to get along in the organization or the "tricks" that the newcomer has to learn to become an accepted member; the feeling or climate that is transmitted in an organization by the physical layout and the way in which the members interact with customers, suppliers and other external instances In this paper, the need for an Organizational Culture approach is based on the microenterprise Paletería la Michoacana, where the concepts are taken and illustrated with results in a practical case, with the General Objective of Implementing a corporate culture in the Paletería la Michoacana, that conveys a sense of identity to the members who belong to the organization, and that facilitates the generation of commitment to something greater than individual interest. Specific objectives: o Define borders or create differences between an organization and others o Be a company that gives sense and control to guide and shape the attitudes and behavior of employees. Organizational culture provides the ability to act strategically and efficiently through business values. These indicate the way in which different business needs can be solved, as well as the direction that all members of the company will follow.

#### **Culture, Organizational culture, Theories of culture**

## **Impact of the implementation of integrating evidence at the higher level: the Tabasco case**

## **Impacto de la implementación de evidencias integradoras en el nivel superior: caso Tabasco**

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### **Abstract**

The final project provided relevant information to support the teaching activities of the institutions that served as a sample of this research- Polytechnic University of the Gulf of Mexico, Vasconcelos University of Tabasco, Juárez Autonomous University of Tabasco (Multidisciplinary Academic Division of Comalcalco), Higher Technological Institute of Comalcalco- the contribution to the educational field will serve to increase the quality of the classes, the results show the reality in the classrooms, the perception of the students, teachers and administrators who collaborate in this task. At the beginning of the project it was known that it would not be easy to develop it due to all the inconveniences presented, and in the end it is very satisfying to have a support material for decision making. The lack of collaboration, teamwork, has been increasing in organizations mainly when talking about a project where these fundamental aspects are required.

### **Competencies, Higher Level, Integrative Evidence**

## **Impact of the COVID-19 Contingency on the Food Process Engineering career at UTSOE**

## **Impacto de la Contingencia de COVID-19 en la carrera de Ingeniería en Procesos Alimentarios en UTSOE**

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### **Abstract**

The present research was conducted at the Southwest Technological University of Guanajuato (UTSOE), a public university with in-person classes. It focused on the impact of distance education resulting from the COVID-19 contingency, during which face to face classes were suspended at all levels. Surveys were administered to eighth and eleventh-semester groups during the corresponding period of January - April 2021, from the food processing engineering program. The research investigated the effectiveness and efficiency of the adopted Virtual Teaching-Learning Environments. The data collected were coded and analyzed using Excel 2016 and IBM SPSS Statistics V21, through descriptive analysis. The study revealed that students' motivation has significantly decreased since the beginning of the pandemic, with a majority experiencing at least one disorder, and 48.6% being at risk of dropping out. Therefore, it is concluded that, despite the university's appropriate measures to handle the new modality, students have been significantly affected, especially in psychological and emotional aspects.

**Distance Learning, Impact, Desertion**

## **Implementation of the dual system within the TSU career in design and industrial fashion, production area**

## **Implementación del sistema dual dentro de la carrera de TSU en diseño y moda industrial, área producción**

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### **Abstract**

This work shows the learning process in **which** you work at the same time or at the same time, the learning acquired at the university with the work in the company, that is, the knowledge acquired in your academic stay and the relationship of the different areas. work assigned in the labor field, calling it this way, **dual** system, it is worth mentioning that the student is assigned an academic advisor (teacher or tutor) by the university and a business advisor assigned by the beneficiary company (manager, manager, coordinator), in this way the student has the attention of both parties, strengthening **academic** and work learning, it is worth mentioning that the change of area in its periodicity or temporality is assigned by consensus between the business advisor and the academic advisor, so the same way the areas to assign, by means of a work plan where it is established at the beginning of the student's stay in the company.

### **Dual System, Apprenticeship, Work Environment**

## 6 Agricultural Sciences and Biotechnology

### **Yahualica tree seedling chile production (*capsicum* annum) on different substrates and its behavior during the development of the crop**

### **Producción de plántula de chile de arbol Yahualica (*capsicum annum*) en diferentes sustratos y su comportamiento durante el desarrollo del cultivo**

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#### **Abstract**

In order to observe the differences between substrates in the production of Yahualica chili pepper (*Capsicum annum*) seedling and plant, in the field and greenhouse at the University Center of Cs. Biological and Agricultural of the University of Guadalajara, this investigation was carried out, where six substrates were evaluated: Promix-GLX, Promix-FLX, Sunshine-3, Berger-BN2, Germinaza and 50% Germinaza + 50% Earthworm Humus. In seedlings, the following were evaluated: Emergence Speed, Emergence Percentage, Stem Thickness, Seedling Length, Number of Leaves, Fresh Weight Aerial Part, Fresh Weight root, aerial part dry weight and root dry weight, and during plant development in field and greenhouse: Plant height, and Fresh weight of ripe fruit. Significant differences were found between treatments ( $P \leq 0.05$ ) in the seedling and plant quality variables. Consequently with the mixture of 50% Germinaza + 50% Earthworm Humus, Berger BN2 and Sunshine 3, the best seedling quality was obtained. And moreover the best plant development was observed in the greenhouse, with an average plant height of 139 cm and a fresh fruit yield of 651 g. When germinaza was combined with earthworm humus (50:50), the results were significant to obtain vigorous plants, high percentage of emergence.

**Substrates, Emergence, Agricultural, Seedling Quality, Humus, Significant, *Capsicum Annum***

## **Use of Agroindustrial Waste of Orange to Obtain: Bioalcohol, Essential Oils and Activated Carbon**

### **Aprovechamiento de los Residuos Agroindustriales de la Naranja para la Obtención de: Bioalcohol, Aceites Esenciales y Carbón Activado**

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#### **Abstract**

The generation of agro-industrial waste in recent years has caused a worldwide problem, which is why the concern arises to take advantage of its components to be used, since said waste can be treated until the negative impact that its disposal could generate is reduced; turning them into a useful and value-added product. The objective of this project is to take advantage of the agro-industrial residues of the orange to obtain bioalcohol, essential oils and activated carbon, beginning with the collection of the residues in orchards and industries and through a pre-treatment to them, of which a part passes to a fermentation process with *Saccharomyces cerevisiae* and the 2nd. Part, it goes through an extraction process by hydrodistillation, the waste obtained from the previous processes is used to obtain activated carbon, in this way we generate a secondary product that benefits said process by significantly reducing any residue.

**Agroindustrial Waste, Essential Oils, Activated Carbon, Bioalcohol**

## **Wetland nutrient assessment in lake Patzcuaro, Michoacan, Mexico**

### **Evaluación de nutrientes en el humedal del lago de Patzcuaro, Michoacan, Mexico**

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#### **Abstract**

Wetland ecosystems are also located inside freshwater lakes as in Patzcuaro considered one of the most important natural lakes of Mexico due to its environmental, economic, cultural and social attributes. Extensive areas of this lake, its fauna, native flora and watershed are severely affected by sewage without treatment, fertilizers non-point runoff derived from agriculture, deforestation, and inadequate land use change. Within the most altered aquatic components from these processes is the wetland ecosystem which is the objective of this study because of its ecological and biogeochemical importance in Lake Patzcuaro. In this study the dynamics of total phosphorus and inorganic nitrogen inside the littoral wetland located in the southern shore of Patzcuaro where seven sites were established located inside the wetland, limnetic zone, and an underwater spring in a transect of 1,500 m long. The obtained values of dissolved total phosphorus and inorganic nitrogen indicated that these nutrients are retained when these components crossed the wetland ecosystem in 67.5% and 70.8% respectively. Hence, the wetland ecosystem is functioning as natural filter and the inputs from other pathways are deteriorating lake water quality.

#### **Wetlands, Shores, Nutrients**

## **Use of silicon in the production of tomato (*lycopersicon esculentum* mill.) Grape type in culture in nutritional solution**

## **Uso de silicio en la producción de tomate (*lycopersicon esculentum* mill.) Tipo grape en cultivo en solución nutritiva**

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### **Abstract**

The objective of the research was to evaluate the effect of the concentration and method of application of silicon on the growth and yield of grape tomato plants.. An experiment was established under shade mesh conditions in solution culture. The factors evaluated were the concentration of silicon (0, 4, 6, 8 and 10 gL<sup>-1</sup>) and the application methods (to the nutrient and foliar solution). The nutrition was applied by irrigation of the universal nutrient solution (Steiner, 1984), at a concentration of 75%. The total number of treatments was 10. The design was completely randomized with four repetitions per treatment and based on the treatments, the following variables: plant height, root length, stem diameter, number of leaves, leaf area, fresh and dry weight of aerial and root biomass, fruit numbers per plant, total yield, and fruit diameter, length, and weight. For the variables evaluated, it was identified that the concentration of 8 gL<sup>-1</sup> of SiO<sub>2</sub> applied to the root was the one that obtained the best value to favor vegetative growth and to obtain a greater development of fruits for grape tomato plants of the Primarino variety.

### **Solutions, Silicon, Tomato**



## Physical characteristics of biopolymers obtained from cereal starch biomolecules

### Características físicas de biopolímeros obtenidos a partir de biomoléculas de almidón de cereales

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#### Abstract

Natural biopolymers have been of great help, due to the versatility of their mechanical, biodegradable and biocompatible properties. They have been adapted for different uses. In the present work the elaboration on a laboratory scale of biopolymers of cereals *Zea mays*, *Sorghum* and *Triticum* is shown, the obtaining of the starch biomolecules by means of alkaline extraction [1], edible chemical modifiers such as citric, tartaric and ascorbic acid were used, glycerin as plasticizer and distilled water for hydration. Eleven experiments E1, E2, E3, E4, E5, E6, E7, E8, E9, E10, E11 were carried out under two drying conditions: room temperature and a Felisa oven at  $30 \pm 1^\circ\text{C}$  for 24 hours. Experiments E1, E2, E3, E4, E7 were made with biomolecules extracted from the starch of the three cereals mentioned, using citric acid as a chemical modifier and experiments E5, E6, E8, E9, E10 and E11 were carried out with standardized starch. tartaric acid and ascorbic acid in order to compare the stability in its macromolecular matrix of the biopolymers. Concluding that the chemical modifier that provides better physical characteristics such as miscibility in biopolymers was citric acid compared to the use of tartaric acid and ascorbic acid. In addition, it was observed that the less molecular weight of starch biomolecules are used and stability at a temperature of  $30 \pm 1^\circ\text{C}$  for 24 hours, a stable, cohesive and flexible biopolymer macromolecular matrix is obtained as shown in experiments E3, E4, E7 and E11.

#### Biopolymers, Macromolecular, Biocompatibility

## **Application for the detection of physiopathies in blueberry crops**

### **Aplicación para la detección de fisiopatías en cultivo de arándano**

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### **Abstract**

Mexico is the 6th. worldwide producer of blueberry with 48,999 tons; where Guanajuato contributes 11% of the national total, ranking 7th. producer of the country (Secretariat of Agrifood and Rural Development, 2020). One of the main physiopathies that occurs in blueberry plants is root suffocation, which limits the ability of plants to breathe through the roots (Generalitat Valencia, 2022). Identifying the severity of the damage caused by physiopathies is essential for timely treatment and the prevention of its transmission; however, it is complex due to the lack of classification criteria. In this context, an application was developed whose purpose is to detect the level of affectation by physiopathies in blueberry leaves, calculating the percentage of damage severity, using artificial intelligence (AI). The results allow us to conclude that AI provides an easy and incremental progression as it is applied to different varieties of physiopathies, through the analysis of photographs. The application is useful for blueberry farmers and greenhouse owners, providing convenient information for the prevention and spread of crop diseases and improving decision-making.

**Artificial Intelligence, Physiopathy, Agriculture**

## 7 Engineering

### Assessment of quality defects in a production area of an SME

### Evaluación de los defectos de calidad en el área de producción de una PYME

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### Abstract

The importance of this study lies in the support SMEs require in terms of the limitations of technologies and work methods for carrying out their daily activities in some manufacturing processes that businesses conducts. The objective was to measure the dependence of the quality defects found in fuses when considering using a new welding component in the production lines. Even with a quality management system, some defects were presented in the final product. Therefore, the methodological design was performed to identify variable defects in fuses, welding components, and production lines. Likewise, the chi-square statistical test was applied to determine the dependence between the variables that intervene in the process. The information obtained was analyzed through the SPSS 20 statistical program. The results showed dependence between the variables, allowing proposals to be established to correct the defects.

**SMEs, Dependence, Manufacturing processes**

## **An approximation to statistical analysis of recession curves of a karst system in a plain**

### **Una aproximación al análisis estadístico de las curvas de recesión de un sistema kárstico en una llanura**

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#### **Abstract**

A number of models exists to analyze discharge recession curves (RC), such as Boussinesq (BM) and Maillet (MM) models, which were derived from theoretical equations of groundwater flow. This paper presents the results of a study, analyzing water table recession curves, whose objective was to determine the model that best represents the dynamics of the karst aquifer in the northern plain of Yucatan, Mexico. The above was achieved defining statistical criteria to select the model; implementing a statistical analysis strategy to compare the estimates of the parameters of greatest hydrological interest of the chosen decay models. Two scenarios were considered for the analysis: I.- Two wells with the same time intervals with standardized data of: different initial hydraulic head ( $h_0$ ); similar  $h_0$ ; modified  $h_0$ . II.- A single well, starting from an established hydraulic head and discharge in the same period of time. Numerical methods were used to fit models to the observed RCs and a maximum likelihood function for parameters estimation. Statistical criteria were established to choose the best model. The Boussinesq model proved to be the most appropriate, whose estimates of the parameter  $\alpha$  were explored, using fixed values of the parameter  $n$ . The comparison between the estimates of  $\alpha$  was made based on hypothesis tests (t to compare between two values of  $\alpha$  and F for the comparison between more than two values of  $\alpha$ ). Quasiprobability distributions obtained by a maximum likelihood estimator were also used. The best estimates of  $\alpha$ (BM) are obtained with values of the parameter  $n$  between 0.5 and 2.

**Aquifer, Estimates, Groundwater, Karst, Models, Statistics**

## **Organic coconut-aloe spiral made from coconut mesocarp and aloe vera**

### **Espiral ecológico coco- aloe a base de mesocarpio del coco y aloe vera**

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#### **Abstract**

The present investigation has the purpose of making a coconut-aloe spiral with coconut tow, looking for ecological alternatives that do not affect health or the environment, one of them is the use and transformation of coconut tow giving added value to this material, being a by-product (waste or garbage), taking it to the transformation process, to incorporate it into the production and marketing methods. This research is of a mixed type, a questionnaire was developed as an instrument for data collection in the community of Ejido las Piedras Huimanguillo belonging to the state of Tabasco, for its elaboration the technique of a survey of alternative questions was considered as a construction criterion, Likewise, indicators were taken into account for the evaluation of the spiral. It is a suitable product for any human being, it controls mosquitoes in homes achieving a better benefit, where it does not contaminate or directly affect the environment and consumer health. The coconut-aloe spiral inside the homes according to the survey carried out achieves a better substitution of the common raidolith, according to the objectives that were set within the project, precision compliance is given.

**Coconut, Aloe Vera, Ecological, Spiral**

## **Implementation of a BSN for the detection of activities during the coffee harvest**

### **Implementación de una BSN para la detección de actividades durante la recolección de café**

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### **Abstract**

Currently, Body Sensor Network (BSN) body sensor networks are generating great interest due to applications in different scientific and industrial environments, they form a technology that allows data acquisition for research and process control. That is why the design of an architecture is proposed, based on networks of body sensors for real-time analysis during the coffee harvesting process because the workers are subject to repetitive physical movements and thus generate a knowledge base and a machine learning model to present the mathematical models with the intention of justifying the decisions made from the coffee harvesting activity. The suit consists of two modules placed on the arms of the people and another on the thorax, which are the reference points for taking the data, thus making use of today's wearable devices.

### **Acquisition, Movements, Models**

## **Design and construction of a knife sharpening machine**

### **Diseño y construcción de máquina afiladora de cuchillas**

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### **Abstract**

The objective of this project was to design and build a blade sharpening machine for bagging and sleeve machines from the Excel Nobleza company, with a capacity of up to 66 cm, to reduce the costs of the blade sharpening service and also eliminate shipping costs. . First, an investigation on sharpeners and sharpening methods was carried out, then mechanical, structural and electrical calculations were carried out. The design of the machine depended absolutely on the materials obtained during the process of searching for materials within the company, adjusting them to the proposed calculation and design. Subsequently, the assembly of the machine, the assembly and programming of the electrical and electronic components, as well as the functional tests, were carried out. The design and manufacture of the sharpening machine was successfully completed, optimizing the sharpening process and saving monetary resources. The machine was manufactured with parts that the company already had in stock or were machined with existing resources, consequently, the investment was zero or minimal

### **Capacity, Functional, Optimizing**

## **Economic and environmental dispatch of power systems: minimising CO<sub>2</sub> emissions by integrating renewable energy sources**

### **Despacho económico y medioambiental de los sistemas eléctricos: minimización de las emisiones de CO<sub>2</sub> mediante la integración de fuentes de energía renovables**

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#### **Abstract**

This paper analyses the impact of the integration of renewable energy sources on the economic and environmental operation of power systems (PS). The models of renewable energy sources, as well as the generation cost function and Carbon Dioxide (CO<sub>2</sub>) emissions are integrated in an Optimal Power Flow (OPF) formulation in order to obtain a non-linear multi-objective optimisation model, which considers economic and environmental aspects. This OPF model, having integrated the models of renewable energy sources, allows to evaluate the impact that these energy sources have on the minimisation of generation cost and CO<sub>2</sub> emissions. In this work, the multi-objective OPF problem is solved using weighting factors for the two functions considered in the global objective function. Several case studies are carried out to evaluate the effect of the integration of renewable energy sources on the economic and environmental operation of power systems. The results of the case studies show that renewable energy sources reduce generation cost and CO<sub>2</sub> emissions.

#### **Renewable Energy Sources, Optimal Generation Dispatch, Power Systems**



## **Study of the Physical-Mechanical characteristics of Concrete in a Concrete-PET mixture**

### **Estudio de las características Físico-Mecánicas del Concreto en una mezcla de Concreto-PET**

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#### **Abstract**

In the field of construction materials, concrete is today one of the most accepted mixtures of materials by the community. Cement is one of the most used products in the world, although large cities are already full of large buildings, cement is still requested in large works. One of the materials widely used as primary packaging are the thermoplastic polymers of the so-called PET (Polyethylene Terephthalate). These materials are currently very polluting mainly in oceans, seas and rivers. The properties of polymers could be exploited to reinforce the properties of concrete and at the same time reuse the polymer to reduce its contamination on the planet. For this research project the experimental methodology was applied consisting of establishing combinations of concrete-PET materials in different ratio. The results obtained from the different mixtures that were prepared from the Flexural Effort tests, it is observed that both in the mixture containing 0.5% PET and in the one containing 1.0%, the results of Flexural Effort are higher compared with the pure mixture.

**Cement, Polymer, Flexion**

## **Strain localization instability in seafloor spreading centers of the Carmen Basin, southern Gulf of California**

### **Inestabilidad de la localización de la deformación en los centros de extensión del fondo marino de la Cuenca del Carmen, sur del Golfo de California**

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#### **Abstract**

This study provides new insights into the geological evolution of the Carmen Basin (CB) in the southern Gulf of California (GC). Using high-resolution bathymetry and seismic reflection profiles, we establish a plate-kinematic framework for this oblique-divergent rift system. By analyzing the crustal composition, we investigate the growth of the bounding transform faults and their role in accommodating transtensional shearing. We propose that the mantle upwelling beneath the CB is a northward extension of the East Pacific Rise. The CB consists of three sub-basins with distinct geometries, morphologies, and evolutionary histories. While the southern and central sub-basins are mostly abandoned, the northern sub-basin is currently experiencing seafloor spreading. This is supported by the presence of younger oceanic crust, approximately less than 1.5 Ma, juxtaposed with older oceanic crust that aligns in age with the nearby Guaymas and Farallon basins to the north and south, respectively. Our findings also indicate favorable geological conditions in the CB for the development of hydrothermal systems similar to those observed in the neighboring Guaymas and Pescadero basins in the southern GC.

#### **Simple Shear Deformation, Crustal Lithology, Fast Seafloor Spreading**

## **Development of mobile apps for use in mathematics**

### **Desarrollo de aplicaciones móviles para su uso en matemáticas**

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### **Abstract**

This work shows the development of three mobile applications with Android system. These apps have the purpose to practice, through play, some mathematical concepts that are important for engineering students. The gamification on mobile devices can be used as a didactic tool in face-to-face learning and e-learning. The use of mobile devices is very common today in society. This allows us to take advantage of them to generate active learning in different areas. Were considered by the development of the applications next steps. First, the general requirements of the game. Then, mathematical concepts that will be used in apps. Next, building the app. And finally, the tests and implementation of these with engineering students. The results of the test and implementation show that the applications were functional for the students. However, these apps have opportunities for improvement, mainly in the interface whit the aim to have, for example, better interactivity.

**Mobile App, Mathematics, Active Learning**

## **Defect Injection Prevention in Software Development: An Introspection into Historical Projects carried out at Software Factory TecNM: Zacatecas Sur**

### **Prevención de Inyección de Defectos en el Desarrollo de Software: Una Introspección a Proyectos Históricos realizados en la Fábrica de Software TecNM: Zacatecas Sur**

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#### **Abstract**

Around software development, there are many variables, which provide support for calculating different quality factors or simply for keeping historical data and learning lessons from previous developments; from these data, decisions can be made to improve the activities carried out in processes and in development methodologies. The aim of this research is to gather and analyze the defects identified by the development team during the inspections they conduct in the testing phase, in order to prevent the same defects in future developments. Additionally, it involves analyzing the impact that timely detection has on time and forming high-performance development teams. Starting from the system development using web-based programming technologies for users, defects encountered during the development process are collected and consolidated into a template based on the ISO 29110 standard. This template is adapted to work with small software development entities, particularly in the Software Project Implementation process. The most significant contribution lies in raising awareness about defect prevention through the induction provided to software project collaborators.

#### **Defects, Development, Implementation**

## **Graphical Interface for Wind Resource Estimation in a Region, Case Study: Cuatrociénegas, Coahuila de Zaragoza, Mexico**

### **Interfaz Gráfica para la Estimación del Recurso Eólico en una Región, Caso de Estudio: Cuatrociénegas, Coahuila de Zaragoza**

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#### **Abstract**

Mexico has an estimated wind potential of 70 GW, however, until 2022 only 7.3 GW were used. This is due, among other factors, to the lack of analysis of the wind resource in many of the country's regions, especially in those where the wind potential is not obvious. With the aim of promoting wind power throughout the country, a free application has been developed that analyzes the resource in detail in any region using the annual records of its wind speed and direction. To demonstrate its functionality, data from the year 2022 from Cuatrociénegas, Coahuila de Zaragoza were used, obtaining the average energy density per hour (MED) using two analytical methods and the Weibull probability distribution function (WPDF). The instantaneous power curve, the histogram of the occurrence of the wind and the wind rose that shows the predominant direction of the wind and its trend of change were also presented. In conclusion, the developed application provides the necessary information to evaluate the technical feasibility of installing horizontal axis wind turbines in the analyzed region.

**Wind resource, WPDF, MED**

## **Maintenance management of pneumatic equipment and facilities at a plant in the industrial corridor in the south area of the State Of Tamaulipas**

### **Administracion del mantenimiento a equipos neumaticos e instalaciones en una planta del corredor industrial de la zona Sur Del Estado De Tamaulipas**

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### **Abstract**

Maintenance planning is focused on production, the work is to limit, avoid and correct failures. The planning is focused on the processes, all maintenance must follow a pre-established and planned process according to the company's maintenance manual. Continuous improvement and planning help to evaluate and improve the execution of maintenance and production in the company. Planning and scheduling are a fundamental part of the proper functioning of maintenance. The development of a company is an organized system that, thanks to the effort and proper functioning of the teams, such as the personnel that work in it; This entire system has an end and is to provide a high-quality service that is competitive at the national level. Each company has a different methodology to manage the maintenance of their equipment and as technology advances, they are renewed for optimum performance. In Altamira, the growth of the companies has been exponential due to a correct administration in their production line, avoiding long delays or inconveniences that affect the company in a monetary way.

### **Processes, Administration, Production**

## **Development of prototype and measurement, control and automation system in real time for small production greenhouses**

### **Desarrollo de prototipo y sistema de medición, control y automatización en tiempo real para invernaderos de pequeña producción**

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### **Abstract**

The main objective of this work is to develop a real-time control system and accessible instrumentation for small production greenhouses located in the State of Guanajuato; whose goal is to increase production, make optimal use of the irrigation system and efficient water management. For this, a prototype of a greenhouse irrigation system was built with the inclusion of temperature sensors, environmental relative humidity, flowmeters, solenoid solenoid valves and soil humidity sensors, these values are compared with a numerical model to corroborate the magnitudes obtained and assess the delivery of flow and irrigation time in each section of the laboratory greenhouse. The development of a graphical interface in LabVIEW for the control and operation of sensors and the complete irrigation system stands out, being this quite intuitive and easy to use for a farmer. The results obtained from the work show differences between the measured and modeled of the hydrodynamic variables in a range of 8 to 10%, where it is concluded in an improvement in the development of the code in Arduino for its optimization in response time and migration to mobile platforms.

### **Greenhouse, Control, Measurement**

## **Development, design, and implementation of a Solar Cooling System**

### **Desarrollo, diseño e implementación de Sistema de Refrigeración Solar**

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### **Abstract**

Variations in extreme temperatures seriously affect crops, making it necessary to maintain a stable temperature inside the greenhouses between 17°C and 24°C. The conventional air conditioning systems used by the producers are electricity and gas, both highly polluting and expensive. Considering the benefits of alternative energies, this project is developed, which consists of the design, development, and start-up of an experimental research prototype that works with solar energy. The objective is to create a refrigeration system using a parabolic channel with a solar tracker, complemented with an absorption machine that allows maintaining the temperature of a greenhouse at 24°C, an interface in specialized software, and data collection with compact RIO. It is concluded that the prototype performs the heat transfer in such a way that it generates cold with the heat accumulated by the parabolic trough. Operational limits of the parabolic trough, the absorption machine, and the system's feasibility to scale to one- hectare greenhouse was established. It is recommended to continue investigating and implementing strategies that use alternative energies that contribute to reducing polluting emissions into the environment.

### **Parabolic Trough Collector, Cooling System, Alternative Energies**



## **Simulation of the behavior of the flow of electrons between the electrodes of a thermionic converter**

## **Simulación del comportamiento del flujo de electrones entre los electrodos de un convertidor termoiónico**

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### **Abstract**

Thermionic converters have been shown to be an alternative to generate electrical power from thermal energy, however, efficiency is reduced by its internal impedance. This impedance has not been possible to suppress because thermionic converters require an ionized cesium atmosphere to transport the electrons. Different authors, have proposed alternatives to reduce this impedance, however, this continues being the main limitation to improve the efficiency of thermionic converters. Recently Fitzpatrick et. al have been working with cesium diodes of near spacing which have shown the possibility of decreasing this impedance when working with thermionic converters in Knudsen mode. In this paper, a theoretical analysis of high vacuum thermionic converters based on the fundamental laws of electronic emission is presented. The most important result was the explanation of the curve I vs V of a thermionic diode from its birth to its saturation. And the development of the algorithms that allow the use of the equations that predominantly explain the emission of electrons.

**Simulation, Thermionic, Convert**

## **Computational algorithm for search and detection of metabolites in CDF(GCxGCxMS) files**

### **Algoritmo computacional para la búsqueda y detección de metabolitos en archivos CDF (GCxGCxMS)**

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#### **Abstract**

Metabolomics is the most novel of the omic sciences, which is responsible for the study and comparison of metabolites. In this study, gas chromatography mass spectrometry (GC-MS) and two-dimensional gas chromatography time-of-flight mass spectrometry (GCxGC-TOFMS) were used for the identification of metabolites found in the blood, which, throw their results in CDF files for further analysis. Metabolic profiles of healthy patients were analyzed using multivariate data analysis techniques, which showed clear differences between the metabolites found, and compared with the universal Golm Metabolome Database (GMD), allowing them to be identified with a high percentage of coincidence. The results found reinforce the advantages of GCxGC-TOFMS and the role of metabolomics in the characterization of metabolites useful for different areas of biology.

**Chromatography Gas, Mass Spectrometry, Metabolomics**

## **Interactive Simulator for Teaching-Learning of Page Replacement Algorithms in Operating Systems**

### **Simulador Interactivo para la Enseñanza-Aprendizaje de Algoritmos de Reemplazo de Páginas en los Sistemas Operativos**

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#### **Abstract**

Topics considered difficult for university students taking some courses in computer sciences could cause them academic stress, mainly when for this kind of topic, there is little or no didactic material available to the instructor, that she could use as a teaching-learning tool. This kind of tool can help the student to learn or reinforce her knowledge on her own. In this work, we describe the proposal of a teaching-learning interactive tool for the course of operating systems, and it is about the implementation of a simulator to learn some page- replacement algorithms in operating systems that allow the student to identify not only the replacement algorithm, but also the important elements associated with the functioning of these algorithms, like the dispatcher, the processes, the instructions and the clock. So far, a prototype of simulator that implements the page- replacement algorithm, called aging, that uses Round Robin as a dispatcher algorithm has been built. With this kind of tool, we hope in the future, to contribute to the decrease of academic stress by facilitating the professor's teaching process and to achieve meaningful learning.

**Academic Stress, Page Replacement, Meaningful Learning**

## Web system for vehicle management in a University Center

### Sistema web para la gestión vehicular en un Centro Universitario

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### Abstract

This article presents the development process of a web application designed to manage the entrances and exits of institutional vehicles at the University Center for Exact Sciences and Engineering of the University of Guadalajara, under the supervision of the Coordination of General Services. A detailed description of the analysis, design and development of the project is provided. The web application was developed in the Mobile Programming and Innovation Laboratory, with the purpose of digitizing and automating the vehicle registration and control process, replacing the manual filling of sheets or folios with an efficient web system. The main objective of the project was to improve the efficiency and precision in the registration of departures and returns of vehicles, through the capture, storage and consultation of various data related to drivers, vehicles, itineraries, fuel, tools and equipment, mileage, among others. Relevant aspects for vehicle control. The development of the project was carried out applying the agile SCRUM methodology, which is characterized by its focus on adaptability, iterative delivery, effective collaboration, value generation and efficient risk management. SCRUM allowed greater flexibility in development, ensuring customer satisfaction and alignment with their needs and expectations.

### Scrum, Software, Web System

## **Integrative project: CNC technology and micro-wire (MIG) welding for precision and efficiency in industry**

### **Proyecto integrador: Tecnología CNC y soldadura de microalambre (MIG) para la precisión y eficiencia en la industria**

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### **Abstract**

In this scientific divulgation article, the impact of Computer Numerical Control (CNC) welding machines in the welding industry will be explored through an integrative project carried out at the Universidad Tecnológica Cadereyta. The main objective is to analyze the importance and added value of this technology in terms of control and automation of welding processes, as well as the power plant that supports its implementation and the safety of the developed prototype. In this sense, the significance of the variables involved in the project will be discussed and the criteria used for their evaluation will be compared. In addition, an overview of the results obtained and the conclusions derived from this project will be shared. Also, possible areas for improvement in this field will be highlighted, considering future research opportunities. In summary, this popular science article examines the impact of CNC welding machines in the welding industry, highlighting their importance, the problems they address and the relevance of safety in their implementation. In addition, it presents the results obtained, the conclusions of the project and the prospects for future improvement.

**Welding, Industry, Technology**



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