Journal of Technical Education

Journal of Technical Education

Definition of Journal

Scientific Objectives

Support the international scientific community in its written production Science, Technology and Innovation in the Field of Humanities and Behavioral Sciences, in Subdisciplines Evaluation, teaching and teaching, learning and development of cognitive processes, Planning for the potentializing of learning, Development of competencies through expected learning.

ECORFAN-Mexico, S.C. is a Scientific and Technological Company in contribution to the Human Resource training focused on the continuity in the critical analysis of International Research and is attached to CONACYT-RENIECYT number 1702902, its commitment is to disseminate research and contributions of the International Scientific Community, academic institutions, agencies and entities of the public and private sectors and contribute to the linking of researchers who carry out scientific activities, technological developments and training of specialized human resources with governments, companies and social organizations.

Encourage the interlocution of the International Scientific Community with other Study Centers in Mexico and abroad and promote a wide incorporation of academics, specialists and researchers to the publication in Science Structures of Autonomous Universities - State Public Universities - Federal IES - Polytechnic Universities - Technological Universities - Federal Technological Institutes - Normal Schools - Decentralized Technological Institutes - Intercultural Universities - S & T Councils - CONACYT Research Centers.

Scope, Coverage and Audience

Journal of Technical Education is a Journal edited by ECORFAN-Mexico, S.C. in its Holding with repository in Republic of Peru, is a scientific publication arbitrated and indexed with semester periods. It supports a wide range of contents that are evaluated by academic peers by the Double-Blind method, around subjects related to the theory and practice of Evaluation, teaching and teaching, learning and development of cognitive processes, Planning for the potentializing of learning, Development of competencies through expected learning with diverse approaches and perspectives , That contribute to the diffusion of the development of Science Technology and Innovation that allow the arguments related to the decision making and influence in the formulation of international policies in the Field of Humanities and Behavioral Sciences. The editorial horizon of ECORFAN-Mexico® extends beyond the academy and integrates other segments of research and analysis outside the scope, as long as they meet the requirements of rigorous argumentative and scientific, as well as addressing issues of general and current interest of the International Scientific Society.

Arbitration Committee

Assignment of Rights

The sending of an Article to Journal of Technical Education emanates the commitment of the author not to submit it simultaneously to the consideration of other series publications for it must complement the Originality Format for its Article.

The authors sign the Authorization Format for their Article to be disseminated by means that ECORFAN-Mexico, S.C. In its Holding Republic of Peru considers pertinent for disclosure and diffusion of its Article its Rights of Work.

Declaration of Authorship

Indicate the Name of Author and Coauthors at most in the participation of the Article and indicate in extensive the Institutional Affiliation indicating the Department.

Identify the Name of Author and Coauthors at most with the CVU Scholarship Number-PNPC or SNI-CONACYT- Indicating the Researcher Level and their Google Scholar Profile to verify their Citation Level and H index.

Identify the Name of Author and Coauthors at most in the Science and Technology Profiles widely accepted by the International Scientific Community ORC ID - Researcher ID Thomson - arXiv Author ID - PubMed Author ID - Open ID respectively.

Indicate the contact for correspondence to the Author (Mail and Telephone) and indicate the Researcher who contributes as the first Author of the Article.

Plagiarism Detection

All Articles will be tested by plagiarism software PLAGSCAN if a plagiarism level is detected Positive will not be sent to arbitration and will be rescinded of the reception of the Article notifying the Authors responsible, claiming that academic plagiarism is criminalized in the Penal Code.

Arbitration Process

All Articles will be evaluated by academic peers by the Double Blind method, the Arbitration Approval is a requirement for the Editorial Board to make a final decision that will be final in all cases. MARVID® is a derivative brand of ECORFAN® specialized in providing the expert evaluators all of them with Doctorate degree and distinction of International Researchers in the respective Councils of Science and Technology the counterpart of CONACYT for the chapters of America-Europe-Asia-Africa and Oceania. The identification of the authorship should only appear on a first removable page, in order to ensure that the Arbitration process is anonymous and covers the following stages: Identification of the Research Journal with its author occupation rate - Identification of Authors and Coauthors - Detection of plagiarism PLAGSCAN - Review of Formats of Authorization and Originality-Allocation to the Editorial Board- Allocation of the pair of Expert Arbitrators-Notification of Arbitration -Declaration of observations to the Author-Verification of Article Modified for Editing-Publication.

Instructions for Scientific, Technological and Innovation Publication

Knowledge Area

The works must be unpublished and refer to topics of Evaluation, teaching and teaching, learning and development of cognitive processes, planning for the potentializing of learning, Development of competencies through expected learning and other topics related to Humanities and Behavioral Sciences.

Presentation of the Content

In the first article we present *Perception of the students of the Human Capital Administration career on the return to face-to-face classes*, by RUIZ-ESPARZA-OCHOA, Sandra, SÁNCHEZ-SOTO, Claudia, RAMÍREZ-SILVA, Macario Alejandro and JUÁREZ-HERNÁNDEZ, Sandra Elizabeth, with adscription in the Universidad Tecnológica de León, second article we present *Development and implementation of the academic portal for optimization of services*, by ROURA-VÉLEZ, Ernesto, RODRÍGUEZ-CAMPOS, Juan Carlos, RICO-CHAGOLLÁN, Mariana and VIDAL-ORTIZ, Gabriela, next article *Proposal for educational intervention in the face of external aspects that prevent the development of mathematical competence in the training of engineers*, by SÁNCHEZ-LÓPEZ, Guillermina, SALGADO-SUÁREZ, Gladys Denisse, CONDE-SÁNCHEZ, José Rubén and MORENO-AGUILAR, Ma. Antonia, from the Universidad Tecnológica de Puebla, as fourth article we present *Feasibility and relevance study for the opening educational programs at the bachelor's level of the Technological Institute of La Paz*, by VERGARA-GARIBALDI, María Olivia, VILLEGAS-BARBA, María Jesús, MENDOZA-OSUNA Evangelina and YEPEZ-CASTILLO, Grecia Esmeralda, with adscription in the Instituto Tecnológico de La Paz.

Content

Article   **Page**

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

RUIZ-ESPARZA-OCHOA, Sandra*†, SÁNCHEZ-SOTO, Claudia, RAMÍREZ-SILVA, Macario Alejandro and JUÁREZ-HERNÁNDEZ, Sandra Elizabeth

Universidad Tecnológica de León, Guanajuato, México.

ID 1st Author: *Sandra, Ruiz-Esparza-Ochoa* / **ORC ID**: 0000-0003-1369, **CVU CONAHCYT ID**: 478344

ID 1st Co-author: *Claudia, Sánchez-Soto* / **ORC ID**: 0000-0001-6000-4976

ID 2nd Co-author: *Macario Alejandro, Ramírez-Silva* / **ORC ID**: 0009-0007-5391-9095

ID 3rd Co-author: *Sandra Elizabeth, Juárez-Hernández* / **ORC ID**: 0009-0006-1150-6842

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.

Resumen

El objetivo de este artículo fue analizar la percepción del alumnado de la carrera de Administración, Área Capital Humano sobre el regreso a clases presenciales para determinar el impacto de afectación por COVID-19 con la finalidad de implementar estrategias informativas en escenarios futuros. Se utilizó un diseño descriptivo y explicativo, así como un tipo de estudio transversal. Colaboraron 220 estudiantes, de los 550 que forman parte de la carrera, siendo una muestra del 40%. Se consideraron las variables de: Percepción de riesgo, estilo de vida, relaciones interpersonales, uso de tic´s, apoyo emocional, y economía; para la medición de estas se usó la encuesta, que comprende 36 ítems distribuidos en siete bloques. Los resultados obtenidos lograron que se identificara la percepción del alumnado en relación con las estrategias formativas en época de pandemia, se distinguieron las fortalezas y debilidades, para el logro de las competencias de la carrera, así como el impacto emocional, psicológico, social, tecnológico, económico, y familiar que los estudiantes experimentaron. Finalmente, esto fue una búsqueda entre los mismos alumnos de la carrera, en donde se conocieron sus vivencias marcadas por el suceso sanitario. Este proyecto brindó una escucha y sensibilización con la comunidad estudiantil.

COVID-19, Perception, Risk, Professional

COVID-19, Percepción, Riesgo, Profesional

* Correspondence to the Author (E-mail: sruiz@utleon.edu.mx)

† Researcher contributing as first author.

Introduction

The coronavirus (COVID-19) is considered a historical event given the great havoc it caused in the political, financial, educational and health fields. It emerged at the end of 2019, in Wuhan, China, arriving in Mexico on 27 February 2020. From 15 March of the same year, an increasing rate of contagion was reported in Guanajuato, which led to the extreme measure of confinement for the entire population, and, therefore, the indefinite suspension of on-site classes.

As a result, thousands of students had to adapt to the change to a virtual mode of study and the constant use of technological equipment for two years. This problem is not alien to the context of the Technological University of León in the Human Capital Management programme, offered on campus II.

Among the complications that the students experienced, six can be highlighted, namely risk perception, lifestyle, health, emotional well-being, as well as psychological and social life. Therefore, the need arises to have information on the impact of the resumption of classes in order to generate a series of strategies to know what to do in future scenarios in the context of a pandemic.

Study design

The research was carried out through a quantitative explanatory study with a cross-sectional design at the Universidad Tecnológica de León Campus II, located in the municipality of León, Guanajuato.

Determination of the sample

The sample size was determined by means of the finite population formula using the calculator offered free of charge on the questionpro website. To perform the calculation, it was necessary to know the confidence level, margin of error, and population number. The formula used to obtain the sample size is presented below:

Figure 1 Finite sample size formula
Source: Questionpro.com/en

The sample was made up of 220 students from the TSU Administration degree in the Human Capital Area. It was selected based on a non-probabilistic sampling of a total of 505 students, with a 95% confidence level and a 5% margin of error.

The questionnaire "AD_Contingency Survey", designed for the purposes of this study, is composed of 36 closed questions; this instrument was reviewed by two employees of the educational institution. In addition, the means of communication for its dissemination was by electronic means through a link. The data were collected through the forms platform, which was chosen to fill in the information.

The analysis of the data was carried out on the Microsoft Excel platform, since Google forms provided the data through it, and it also has graphic tools, which helped to illustrate the information by means of pie charts, whose design was modified by changing the colours, the format of the data labels, as well as the graphic elements, and for greater understanding, simple language was used in order to facilitate reading for those interested in the research project.

Results

As shown in graph 1, it can be observed that more than 50% of the students are certain that it is unlikely that they will become infected, therefore, they are in high spirits to resume those activities or routines that were put on hold because of the confinement imposed for security reasons, but even so, 22% consider that the risk may increase because they could return to their lives as they were before the pandemic..

1. En el contexto local, ¿Qué tan probable es que en este momento usted se infecte de COVID?
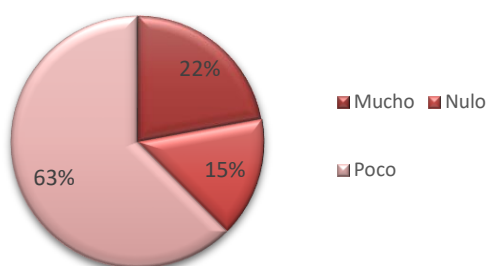
Graphic 1 Probability of infection by COVID-19
Source: Own elaboration

In relation to graph 2, it can be seen that 55% of the students consider that their stress increased due to the confinement due to the pandemic, as well as being in the distance learning modality and spending a lot of time with technology, while a low percentage of 36% of others think that the stress they were already dealing with before increased only slightly.

25. Debido a la pandemia. ¿Considera que el nivel de estrés que maneja normalmente se modificá?
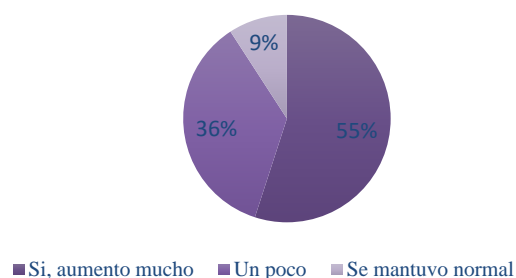
Graphic 2 Level of stress managed by students
Source: Own elaboration

It is logical that the main obstacle was the economy with a 52% response, given that it is normally the factor that is the first and most affected by any major change. Similarly, with this constraint, students came to experience other obstacles such as giving up their studies because they could no longer afford the internet or the necessary equipment, as well as not being able to pay the tuition fees.

33. Durante el confinamiento ¿Cuál fue el principal obstaculo para continuar estudiando?
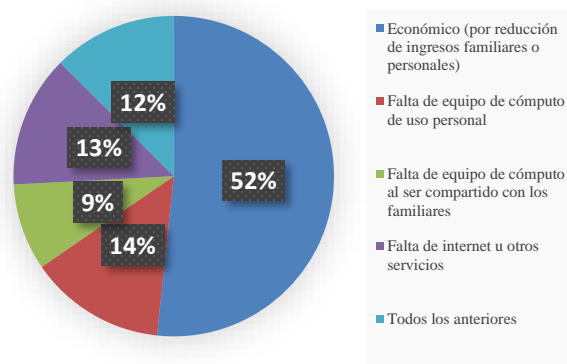
Graphic 3 Main obstacle to continue studying
Source: own elaboration

The most outstanding results reflected in graph 19 show that 54% of the students who responded to the survey think that their level of learning was changed by the distance education model, as it was something new and unknown to university students, which shows that despite having already had interactions with technologies, it is not the same to use it for recreation as for work, in addition to the fact that it was a completely different model to which they were accustomed, in the same way it shows that 38% of the students only partially changed their level of learning.

19. Su nivel de aprendizaje, ¿Se vio modificado por este modelo de educación a distancia?
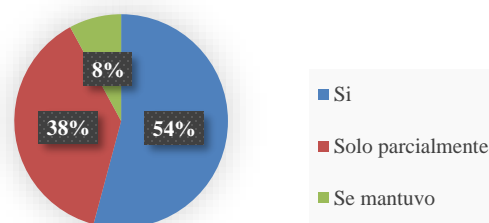
Graphic 4 Level of learning
Source: own elaboration.

It is understandable to observe very similar percentages between the face-to-face modality with 41% and the mixed modality with 22%, given that after two years of the pandemic, students had just enough time to adapt to being at home and the use of technology for learning, but it is worth noting that they also long for and wish to return to face-to-face learning, as most of them feel that this is the right way to learn, so that the percentage that prefers to balance the methods, so as not to delay their studies or modify their lifestyles again, is generated.

20. Con la experiencia adquirida, ¿Cuál método considera que le conviene más a usted?
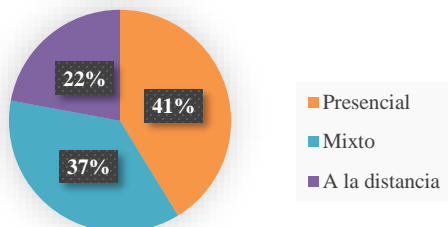
Graphic 5 School method
Source: own elaboration

Discussion

Undoubtedly, the students of the Universidad Tecnológica de León went through events. The theoretical, conceptual and empirical contribution of the cited authors allows for a better understanding of the social dynamics that emerge in a pandemic situation and the relationship with different issues such as economics, health, education and lifestyle, aspects that were affected during the two years of the pandemic.

According to the results, it is possible to highlight the importance of health and strength in the face of this crisis, in addition to the fact that learning levels were broken, reinforced by the use of technology to attend to distance education, in such a way that strategies were diversified to reinforce learning, taking into account the obstacles due to the reduction in income, lack of computer equipment, among others.

Another feature is the positivity of the students to attend classes again, taking into account that the possibility of contagion is not as high as before, however, they do not lower their guard, and continue to comply with preventive measures. As for the level of stress that the students experienced during the confinement, this was modified a lot and in others only a little, given that their strongest obstacle was that of the economy, as already mentioned, some were already working and contributing money to their homes, but they lost that income, others did not work, so they were forced to do so, therefore, the stress that they already managed or had to deal with was modified little or a great deal after certain factors.

In the end, the perception of the students of the Human Capital Management course on the return to classes was known, thus offering the possibility of starting another project in relation to implementing strategies for the training of students and the difficulties of the teaching-learning process during the time of the COVID-19 pandemic, taking this research and its information as a reference.

The project generated certain points of view among those involved in the research, which led to the conclusion that, if the educational purposes were fulfilled, given that it was possible to identify the teaching difficulties during the pandemic, it is still worth noting the solidarity that was perceived among the families during this crisis and the emotional support that some students received.

Thank you

We would like to thank all the students of the TSU in Administration for their participation in the development of this work.

Conclusions

In conclusion, this research generated a new vision of life, given the events that we faced during the crisis caused by the COVID-19 virus, that is to say, that strategies are always found to cope with the most important aspects of our lives, for example, in education, the strategy of the virtual modality was found to continue studying without the possibility of becoming infected or spreading the contagion,

In health, sanitary measures were implemented such as keeping a safe distance, staying at home, reducing seating in certain places such as cinemas in order to respect this distance, as well as putting into practice certain measures that already existed before such as the use of gel and masks.

References

Bisquerra, R. (2009). *Psicopedagogía de las emociones.* Editorial Síntesis. https://bit.ly/3ONOBQc

Calculadora de tamaño de muestra. (s. f.). Questionpro. Consultado el 27 de febrero de 2022. https://bit.ly/3Qr9oKT

Cronología de la pandemia en México. (2021, 1 de marzo). El economista. https://www.eleconomista.com.mx/politica/Cronologia-de-la-pandemia-en-Mexico-20210301-0045.html

Gobierno de México. (2022). Coronavirus. https://coronavirus.gob.mx/

Instituto Nacional de Estadística y Geografía. (2021, 23 de abril). Encuesta para la Medición del Impacto COVID-19 en la Educación (ECOVID-ED). https://www.inegi.org.mx/contenidos/investigacion/ecovided/2020/doc/ecovid_ed_2020_presentacion_resultados.pdf

Quiñones, D. M., Guillen, H., Benavides, C. & De La Cruz, J. A. (2022). Percepción de riesgo a COVID-19 e indicadores de salud mental en trabajadores de un hospital peruano: estudio transversal analítico. *Revista MedWabe, 22* (2). https://doi.org/10.5867/medwave.2022.02.002513

Morales, Y. (2021, 28 de abril). Familias mexicanas las más afectadas de la crisis económica desatada por la pandemia: encuesta OCDE. *El Economista.* https://bit.ly/3S9KGjL

Morán, M. (2020, 2 de junio). *La pandemia para las y los jóvenes.* UNICEF. https://uni.cf/3bhOaAb

Reyes, M. & Meza, M. L. (2021). Cambios en los estilos de vida durante el confinamiento por COVID-19. *Revista Científica Multidisciplinaria de Prospectiva, 28 (4).* https://doi.org/10.30878/ces.v28n4a4

Uribe, J. I., Valadez, A., Molina, N. E. & Acosta, B. (2020). Percepción de riesgo, miedos a infectarse y enfermar de COVID-19 y variables predictoras de confinamiento social en una muestra mexicana. *Revista Mexicana de Investigación en Psicología, 12* (1), 35-44. https://www.researchgate.net/publication/351061745.

Development and implementation of the academic portal for optimization of services

Desarrollo e implementación del portal académico para la optimización de servicios

ROURA-VÉLEZ, Ernesto†*, RODRÍGUEZ-CAMPOS, Juan Carlos, RICO-CHAGOLLÁN, Mariana and VIDAL-ORTIZ, Gabriela

ID 1st Author: *Ernest, Roura Vélez*

ID 1st Co-author: *Juan Carlos, Rodríguez-Campos* / **ORC ID**: 0000-0002-8079-9654, **Researcher ID Thomson**: S-7721-2018, **CVU CONACYT ID**: 263767

ID 2nd Co-author: *Mariana, Rico-Chagollán* / **ORC ID**: 0000-0001-6942-5902, **Researcher ID Thomson**: S-7659-2018, **CVU CONACYT ID**: 691659

ID 3rd Co-author: *Gabriela, Vidal Ortiz*

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

Resumen

La Escuela Normal Oficial de Irapuato (ENOI) surge en el año de 1951 y se ha distinguido por ser una Institución de nivel superior dedicada a la formación de profesionales de la educación preescolar, primaria e inclusión, a través de la adecuada operación de sus planes y programas vigentes. Actualmente la tecnología ha permitido que las personas comuniquen o transmitan información por medio de internet. A pesar de ello, todavía hay instituciones que no cuentan con estas tecnologías, como era el caso de ENOI que carecía de una página web oficialcon su propio dominio. La falta de un sitio oficial provocaba que el público en general no tuviera un fácil acceso a información relacionada con la institución. El objetivo de este proyecto fue facilitar la administración y el despliegue de la información que se presenta en su página mediante un sistema que les permita actualizar la misma sin necesidad de tener conocimientos en algún lenguaje de programación, así como resguardar el sitio web en un servidor propio con su dominio único y desarrollar diferentes perfiles o roles para la administración de la información. Con esto se consiguió darle a la ENOI un lugar donde puede compartir información relevante además de servir como nexo donde se puede ingresar a otros sitios de interés para las personas relacionadas a la institución.

Administración, Dominio, Sitio Web

---

† Researcher contributing as first author.

Introduction

In the past, information was transmitted orally from person to person, but as time went by, technology began to develop to such an extent that nowadays information can be transmitted regardless of distance and through different media. One of the largest and most important means of communication today is the Internet.

Many public institutions (such as the Instituto Tecnológico Superior de Irapuato (ITESI)) and private institutions (companies such as Grupo BIMBO) have evolved the way they communicate, using web pages that can be accessed from the Internet where they display relevant information for the public.

Despite this, there are places or institutions that do not have a tool like this, as is the case of the Escuela Normal Oficial de Irapuato (ENOI). For this reason, the objective of this work is the development of a new website that allows the ENOI to have a place to share the information it generates to the general public, as well as for people who belong to the institution. With the addition of facilitating the administration and publication of information by developing a system capable of updating the web page without the need to know any programming language.

Programming language

Buitrago Conde (2010, p.60) comments that "The programming language is the means of communication between a programmer and a computer; it is through the programming language that the programmer 'tells' the computer what actions to execute in order to solve a computational problem".

World Wide Web

The World Wide Web (WWW) is a large global network of computers connected through the Internet. Millions of multimedia contents can be accessed through the WWW.

Web page

It is a digital document hosted on a server that can contain different multimedia content such as text, sound, video and others. It has a format adapted to be able to access this document from a web browser connecting to the World Wide Web or some other network.

HTML

In web programming different languages are used such as HTML, which is an artificial language that computers are able to interpret and designed for programmers to write instructions that browsers execute to create the web page. That is, HTML is a programming language, or a "language that the machine understands and processes to give a response" (Equipo Vertice, 2009).

CSS

The CSS web programming language is one of the most widely used languages in web programming: it is a language for defining the style or appearance of web pages, written with HTML or XML documents. CSS was created to separate content from form, while allowing designers to maintain much more precise control over the appearance of pages (Angel Alvarez, 2014).

JavaScript

With JavaScript you can create different functions that help to have a dynamic web page: JavaScript is presented as a; client/server application development language over the Internet. The JavaScript program has the particularity that it is inserted within the HTML document itself, which presents it to the user and is therefore not a separate program (SanchezMaza, 2012).
(SanchezMaza, 2012)

PHP

According to Arias (2017, p. 13) PHP is "a free interpreted language, originally used only for the development of applications present and acting on the server side, capable of generating dynamic content on the World Wide Web".

SQL

According to Escofet (2002) SQL "is the ANSI/ISO standard language for defining, manipulating and controlling relational databases. It is a declarative language: you only have to indicate what you want to do".

Roles

Roles are a set of permissions granted to a type of user. Each role is capable of doing different things within a computer system. With roles you can have control of what a user can and cannot do in order to have control of the system.

Databases

A database is a set of classified and ordered information usually stored in a digital medium and administered using specialized applications for the management and administration of the information.

XAMPP

XAMPP is one of the most useful tools when testing the performance of a web site: XAMPP is a development tool that allows you to test your PHP-based web development on your own computer without the need for internet access. If you are a web designer or web developer just starting out, it is not necessary to know about server configurations (yet), as XAMPP provides you with a fully functional configuration from the moment you install it. (Garcia, 2020)

PhpMyAdmin

During the development and maintenance of a website it is necessary to manage its database: PhpMyAdmin is a web application that serves to manage MySQL databases in a simple way and with a friendly interface. It is a very popular software based on PHP. The advantage of using a web application is that it allows us to connect to remote servers, which are not always accessible using graphical interface programs (García de Zúñiga, 2021).

Methodology

The basic idea on which the system is developed is to allow all users of the different departments to enter images, texts, links, etc., without the need of a programming language, creating their own news in real time. A prototype-based life cycle is used for the development of this project.

This model follows a similar approach to the waterfall life cycle which according to Pressman (2010) follows five steps as shown in Figure 1. In the prototype-based life cycle the first four steps of the waterfall model have iterations each resulting in a prototype which can be shown to the customer for feedback. After completing all iterations the project reaches the maintenance phase as depicted in Figure 2.
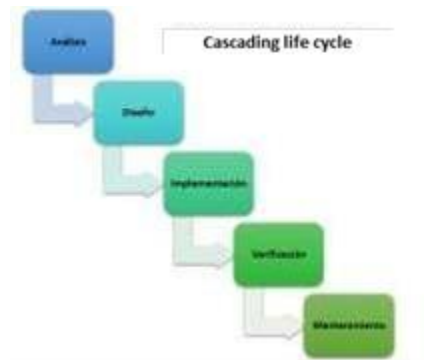
Figure 1 Cascading life cycle.
Source: Own elaboration
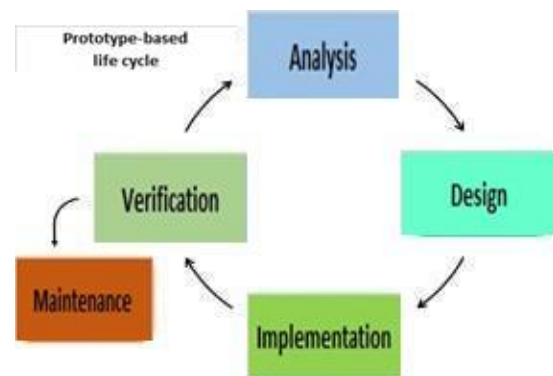
Figure 2 Prototyping-based prototyping life cycle prototypes
Source: Own elaboration

The life cycle based on prototypes was chosen because the project was intended only for the ENOI and frequent meetings could be held with the institution's personnel to receive their comments. In this way, a clearer vision of the final product could be shared with the stakeholders and the staff could better express their corrections.

As can be seen in Table 1, 3 prototypes were made and had 3 essential stages for their development: analysis, programming and presentation.

Activity	Stage
Analysis	Analysis
Design	Programming
Implementation	
Verification	Presentation

Table 1 Stages of the project cycle
Source: Own elaboration

Analysis

In the first stage of the development of each prototype, the analysis section is the most important because it is where all the requirements that the system must meet are obtained. In the first iteration (prototype 1) data collection was done through interviews using a survey applied to the institution's personnel as the main means.

Some of the questions asked in the survey were:

- What information should the web page display?

- What is the information of interest that candidates who want to join the institution need?

- Who will be in charge of updating the web page?

- Which sections of the web page should be edited by a normal user?

- Which sections of the web page should be edited by an administrator?

- Which sections of the web page should be edited by a web designer?

- What are the security requirements?

- What do you expect the system to accomplish?

During the development of the web system, XAMPP, shown in Figure 3, will be used to host the web site locally. In this way tests can be done to check the operation of the web system without the need to host it on a server or hosting.
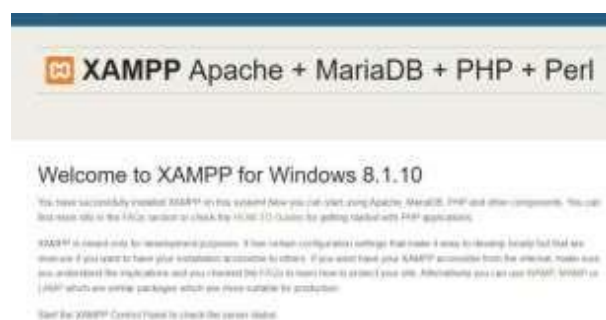
Figure 3 XAMPP platform for local hosting of the web page
Source: Own elaboration

To test the Internet connection and to make the web page compatible with most of the current devices, as well as with the most popular browsers, the free INFINITY FREE hosting is used, as shown in figure 4. At the end of all iterations of the project the web system will be hosted on the school's own server.

Figure 4 Free hosting control panel INFINITY FREE
Source: Own elaboration

In this project the interface of the web system and the database are highly related so it is essential to make a good design taking as a reference the requirements obtained through the interviews to the workers of the institution. The PHPMYADMIN program is used to access, manage and organize the tables and records of the database as shown in Figure 6.

Figure 6 Database manager to organize the database
Source: Own elaboration

Each time a prototype is presented, the comments made by the institution's personnel are taken into account, thus initiating the analysis of the next prototype in which new functions are designed or those already created are corrected in order to comply with the requirements obtained during the analysis made at the beginning of the project. An example of this can be seen in Figure 7.

Figure 7 Sketches of project database designs
Source: Own elaboration

Programming and presentation

Throughout the project, different prototypes were programmed to demonstrate the capabilities of the web system in a visual way. During the development of the first prototype, the objective is to show how the page works, leaving the design (colorimetry, content orientation, font, etc.) in the background. For example, Figure 8 shows the area where the administrative role can create and control users. The page is fully functional allowing to update the database from it, but the design of the form, the place where the web elements are placed and the colors of the page are not the definitive ones.

Figure 8 First prototype of the user administration area.
Source: Own elaboration

Figure 9 shows the section for publishing a news item and viewing the news items currently published. In this section of the web system the user can enable or disable the news published by himself through a form that uploads the information to the database hosted on the server. The administrative role can view the news created by all users.
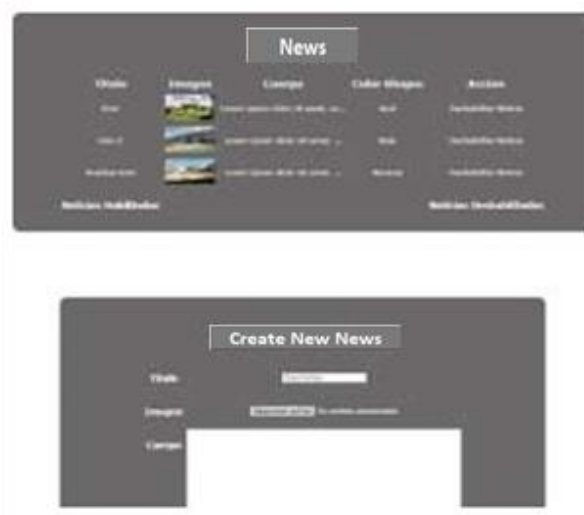
Figure 9 First prototype of the news management section
Source: Own elaboration

During the design, it was taken into account that the news published by the user could be seen by anyone with Internet access, so a way of displaying the news hosted in the database was programmed as shown in Figure 10.

Figure 10 First prototype of the website's news display.
Source: Own elaboration

All programming is carried out with HTML 5 programming language to create the web page, PHP to control requests to the server and display information from the database and the BOOTSTRAP framework to give a more polished design to the website. The Visual Code editor is used to code and edit the code.

Results

Thanks to the implementation of the web system, it was possible to generate a user-friendly environment in which the user can manage the information displayed on the web page in real time, in addition to allowing the user to add or update the contents that appear on the home page and its different thematic blocks.

|Figure 11 shows the control panel where an administrator can see all the news published.

Figure 11 Table showing the news published
Source: Own elaboration

Figure 12 shows the news already displayed on the web page, which are updated when a new news item is added and enabled.

Figure 12 News displayed on the web page
Source: Own elaboration

Conclusions

Communication between an institution and the people it serves must be developed in an efficient way, with secure, open and reliable channels where a user can easily find the information he/she needs. Those in charge of communication must use all the tools at their disposal, evolving the way of communicating as the world advances and finds new ways of transmitting information.

With the elaboration of this project, the needs of ENOI were met, developing a web system that manages to display the necessary information for the public that wants to know more about the institution, allowing different managers to edit and generate new information without the need to know about web page programming.

Establishing new ways of transmitting and generating information as well as updating existing information has helped to improve the relationship between the ENOI and its students by providing them with better service. With the development of this web system, students now have a place where they can receive the most important information about their institution, in addition to having a link where they can find the necessary tools during their academic development.

References

Ángel Álvarez, M. (11 de 2014). Manual de CSS 3. Recuperado de DesarrolloWeb.com: https://www.mardeasa.es/descargas/recursos-paginas-web/css/manuales/manual-css3- nov2014.pdf

Arias, M. A. (2017). Aprende Programación Web con PHP y MySQL IT Campus Academy.

Buitrago Conde, B. H. (2010). EL LENGUAJE DE PROGRAMACIÓN COMUNICACIÓN PROGRAMADOR Y COMPUTADORA. Journal Boliviano de Ciencias, 60-62. Recuperado de http://www.revistasbolivianas.ciencia.bo/scielo.php?script=sci_arttext&pid=S2075-89362010000300012&lng=pt&nrm=iso

Equipo Vertice. (2009). Diseño básico de páginas web en HTML. Málaga: Editorial Vertice

García de Zúñiga, F. (25 de 11 de 2021). ¿Qué es phpMyAdmin y cómo usarlo? Obtenido de Blog de arsys.es: https://www.arsys.es/blog/phpmyadmin

García, M. (30 de 05 de 2020). ¿QUE ES XAMPP Y COMO PUEDO USARLO? Recuperado de Nettix Perú: https://www.nettix.com.pe/blog/web-blog/que- es-xampp-y-como- puedo-usarlo/

Martín Escofet, C. (2002). El lenguaje SQL. Barcelona: Digitalia Hispánica.

Pressman, R. S. (2010). Ingeniería del software. Un enfoque práctico. New York: McGraw-Hill Education.

Sánchez Maza, M. Á. (2012). *JavaScript.* INNOVACIÓN Y CUALIFICACIÓN.
.

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

SÁNCHEZ-LÓPEZ, Guillermina*†, SALGADO-SUÁREZ, Gladys Denisse, CONDE-SÁNCHEZ, José Rubén and MORENO-AGUILAR, Ma. Antonia

Universidad Tecnológica de Puebla, División Mecatrónica, México.

ID 1st Author: *Guillermina, Sánchez-López* / **ORC ID**: 0000-0001-5866-9362, **CVU CONAHCYT ID:** 62657

ID 1st Co-author: *Gladys Denisse, Salgado-Suárez* / **ORC ID**: 0000-0001-7549-3346, **CVU CONHACYT ID:** 508569

ID 2nd Co-author: *José Rubén, Conde-Sánchez* / **ORC ID**: 0000-0001-9950-5348, **CVU CONACYT ID**: 219916

ID 3rd Co-author: *Ma. Antonia, Moreno-Aguilar* / **ORC ID**: 0000-0003-3587-9300, **CVU CONAHCYT ID**: 46731

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

Resumen

Objetivos Establecer una propuesta que permita mejorar el rendimiento escolar de los estudiantes de ingeniería Metodología: La metodología de investigación propuesta fue cualitativa por el método de ensayo controlado. aplicándose a cinco grupos, 3 de primer semestre y 2 de quinto semestre, para identificar los problemas existentes sobre rendimiento académico considerando como variables: malas calificaciones, adaptación, hábitos de estudio, comprensión lectora, razonamiento matemático, problemas emocionales. Con los resultados obtenidos en el diagnóstico se establecieron algunas estrategias de mejora y a lo largo del semestre se fue brindando acompañamiento a los estudiantes detectados, estas estrategias fueron modificándose conforme a los pre-resultados que se iban dando. Para comparar los resultados obtenidos se contó con un grupo de primero y otro de quinto semestre a los que ya no se aplicaron las estrategias de mejora. A mitad y a final de semestre, se aplicaron evaluaciones para identificar la eficacia de las medidas utilizadas. Contribución: La presente propuesta de intervención educativa surge como resultado de la prueba piloto realizada, contiene las acciones implementadas considerando las modificaciones que se realizaron.

Intervención, Educativa, Matemáticas

* Correspondence from the author: (Email: guillermina.sanchez@utpuebla.edu.mx)
† Researcher contributing as first author.

Introduction

The present work is motivated by the interest of proposing strategies that allow the optimal development of mathematical competence in engineering students, which is necessary because when they enter the labor field they must be able to identify problems, understand them, reason the possible solution alternatives, innovate to solve and interpret the solutions based on theoretical grounds, likewise this process must be done by collaboratively socializing knowledge.

This is the basic profile that companies require from candidates who intend to work with them. In the labor field, the term that describes the above characteristics is Mentefactura and refers to the fact that the engineer must innovate and propose solutions to the various problems that arise in different areas.

The country's public universities in the last 30 years have been immersed 30 years have been immersed in constant changes, therefore, they have had to reform the study programs, reconsidering with this the strengthening of the profile of the teachers, in order to change the ways of teaching classes, and that there is not only a transmission of knowledge, but a teaching based on the learning of the students; in addition to this there is a continuous teacher evaluation.

This process has its origins in 1989 when the Education Modernization Program is established by the government of the republic, through which the path of modernization of education is proposed by mentioning as objectives: the renewal of the educational model, professionalize teachers, infrastructure development based on information technologies, depending on the educational field, being this proposal very well accepted by international organizations such as UNESCO (Rodriguez, 2020).

With this reform, various strategies arise through which they try to "motivate" the updating of teachers in higher education institutions, among them, as mentioned by Rodriguez, (2020), are PRODEP, the different scholarships or economic incentives for teaching performance and / or research, the possibility of sabbatical stays, access to competitive funds established by CONAHCYT, RENIECYT, which over the years has led to economic differences in teachers.

For students, various strategies are also implemented to motivate a better performance, with the emergence of scholarships, national and international mobility programs, modifications to the curricula, including the development of reading and writing comprehension skills and collaborative work (Sectorial programs, 1989; 2001-2006; 2007-2012).

Regarding the educational model, it is stated that the mere transmission of knowledge does not allow higher level graduates to optimally apply their knowledge when entering the labor market; this cannot happen magically, during the course of their careers they must develop this ability, so that the way of teaching, what to teach and how to teach is reformulated, international organizations identify it as education for life, modifications are proposed, concepts such as educational quality are implemented, the union of study programs with social needs is established (UNESCO, 1998) (OECD, 2004).

All of the above is at risk of undergoing a new modification due to the so-called republican austerity.

In spite of this, the institutions of higher education IES, improve their study programs to offer students new perspectives of professional and technical training.

The Technological Universities arise with the interest of offering a new option of higher education focused on the analysis, interpretation and good use of information, within its organizational guidelines is to be linked to the productive sector of goods and services.

Among the "novelties" presented by the Technological University of Puebla, is the offer to finish the degree: bachelor's degree and/or engineering in three and a half years, that is, 3 semesters per year and obtaining the degree of "university technician" after two years.

The policies, strategies and lines of action of this university are based on the 1995-2000 national development plan, in which various strategies are proposed in order to lay firm foundations to overcome the imbalances between geographical regions, social groups and productive sectors. It also proposes overcoming the contrasts between individual opportunities for training, employment and income, and substantially expanding the provision of quality services, which are the basis for a dignified life and productive well-being. These services include health, education and housing (DOF, 31/05/1995).

To date, more than 113 technological universities have been created, which have been adapting to regional changes and requirements, as promoted in the institutional mission and vision.

Causes that affect the formation of engineering graduates

The educational models arise with the intention of solving the different "needs" that society has, and have a reduced validity, depending on the mentioned social requirement, which will be determined by the government in turn.

The central part of the educational model of the Technological University of Puebla is to place the student as the main actor, since learning is the central part in the constructivism model, therefore, the student carries out the search for knowledge through a series of contextualized strategies proposed by the teacher, which aim to facilitate understanding by motivating the creation of knowledge (Vielma & Salas, 2000).

Specifically in the division of mechatronics careers, there are agreements with the productive sector with important companies in the automotive industry such as Audi and Volkswagen, which go in two directions, the graduates with the best averages are "captured" by these companies to go to specialize in the period of "stays" which is the "four-month period" eleven, in which students remain only in the company doing their project and depending on their performance may be hired at the end of this period.

In the last year, the dual program with the two aforementioned assemblers was initiated, which consists of the students doing their admission process with them and after a thorough selection process, they begin their preparation, the technical subjects are taken at the plant and the scientific and human development subjects are taken virtually asynchronously with the Universidad Tecnológica de Puebla, Throughout their preparation, which also lasts 3 and a half years, they are accompanied by tutors from both instances, which achieves a complete training for the graduates, having the opportunity to be "trained" based on the specific needs of the assembly plants, as stated in the vision of the institution.

In compliance with the stated mission, the study programs are designed under the competency-based model and are carried out based on the needs of the productive sector of the region, with 70% practical and 20% theory, and two periods of activities in the industry (Rubio, 2006).

Thus, with the aforementioned actions, the Technological University of Puebla complies with both the mission and vision projected in its Institutional Educational Program.

All of the above is important to "bring it down" to the level of our classrooms, where teachers "train" future graduates, this training should be comprehensive so that everything proposed in the institutional program is achieved in real practice, so that they are able to detect problems and propose innovative solutions,

This is what is intended to be achieved as a result of the implementation of any competency-based program. In each subject, the techniques that teachers will put into practice to achieve the particular objectives and thus "contribute" to the achievement of the institutional mission are proposed from their different approaches.

It is worth mentioning that these implemented techniques depend on the development of technology, the socio-cultural and economic needs of the region, as well as the industrial requirements, so that the graduates can be correctly inserted in the labor market.

As mentioned by Diaz, (2006), in competency-based curricula, different teaching and learning strategies are implemented, whose main intention is the integral formation of students so that not only a transmission of knowledge is carried out, but also a real application of the knowledge that students acquire, thus promoting meaningful learning in each subject.

The integral formation of students is not only a matter of acquiring knowledge, it is also necessary as established by the OECD, (2019), to develop civic skills in students so that they have a direct participation in public affairs.

Methodology

As described above this proposal arises as a result of a preliminary implementation where the feasibility of each of the strategies mentioned here was analyzed.

Results

The results obtained in the diagnostic evaluation were:
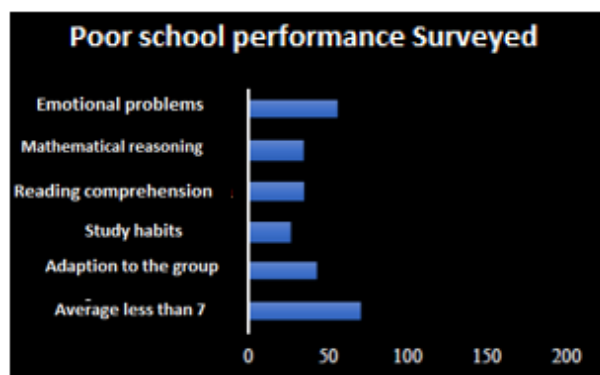
Graphic 1 Diagnostic analysis results
Source: Own elaboration

As can be seen in Graph 1, the 6 variables to be studied have very high values, which shows that they are the causes of the low performance of the students.

After applying the strategies proposed, the progress achieved was evaluated, obtaining, as shown in Graph 2, an improvement in almost all the items.
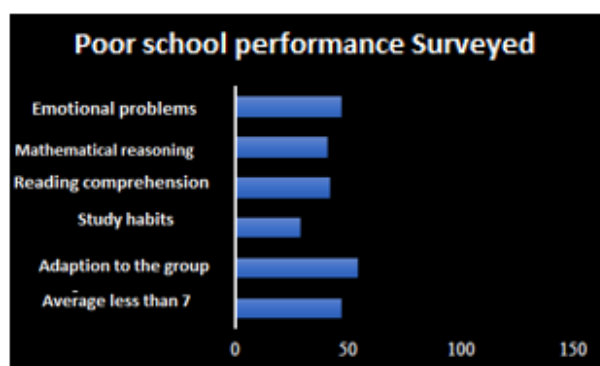
Graphic 2 Intermediate evaluation
Source: Own elaboration

At the end of the four-month period, progress was again evaluated and, as shown in Graph 3, improved results in all areas.
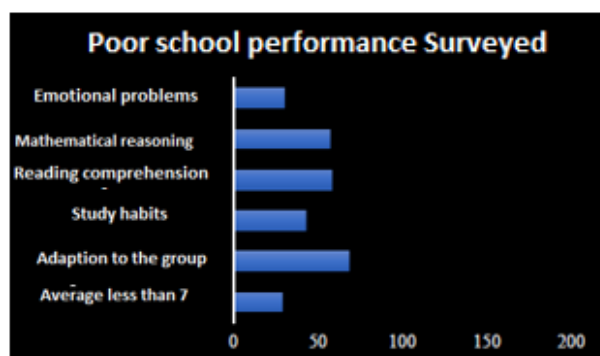
Graphic 3 Final evaluation
Source: Own elaboration

From the three evaluations it was seen that by improving reading comprehension, students also improved their mathematical reasoning, which motivates us to continue implementing strategies so that these items continue to increase and thus achieve the development of mathematical competence.

With the results obtained and the modifications that were made along the way, the following educational intervention proposal was developed.

Strategies to implement

As mentioned by Raventós, (2005), the educational crisis we are going through must be fought by using new pedagogical models, new experiences and ideas for the future.

The need to involve the above arises from the requirements of all the educational actors involved, including institutions and society, to carry out an educational transformation through different strategies.

The present proposal is directed in general for the higher level and in particular for the Technological University of Puebla in the division of mechatronics, the areas invited to join this are:

- Address.

- School services.

- Academics: academy of basic sciences, civic-cultural training.

- Students

- Psychopedagogical department.

- External agents.

Work planning

To select the groups to work with in the first stage of the activity, which will be called sample groups.

Analyze the sample groups in order to identify the existing problems on academic performance considering as variables: poor grades, adaptation, study habits, reading comprehension, mathematical reasoning, emotional problems.

The results obtained in the identification of problems are shared with the departments or coordinations involved.

A meeting with the teachers of the group is proposed with the objective of informing about the results of the first identification of variables that impact in our problematic and therefore to establish the strategies that will be carried out in coordination with all the subjects.

The parental tutors of the students with the detected major problems are requested to attend a meeting where the strategies that the institution will implement to support the students will be explained to them.

A meeting is requested with the students with the major problems detected, with the purpose of giving them instructions about the strategies that the institution will implement for their support, emphasizing how their academic improvement will impact their later insertion to the labor field or to the next academic step, given the social, political, cultural and industrial needs of their context, with which it is intended to raise awareness of the need to improve their academic performance.

Considerations to the work planning.

1. The idea of the intervention proposal is presented to the management for the approval of the project.

2. The diagnostic evaluation is carried out by the teachers of the academies of basic sciences and civic and cultural education, considering mathematical reasoning and reading comprehension.

3. A work schedule is presented, specifying the times, progress and actors involved in the reading comprehension intervention proposal for the improvement of mathematical reasoning.

The activities to be carried out by the academic actors:

Analyze the curricula establishing suggestions, activities and/or projects around the topics of reading comprehension and mathematical reasoning.

Establish courses, workshops, and advising in face-to-face, virtual or hybrid mode with the purpose of improving the detected problems.

Develop spaces where the students' progress in the detected problem can be shown, such as a rally or olympiad type contest.

4.   Teaching intervention:

Depending on the teaching profile and the different subjects taught, link reading comprehension and mathematical reasoning activities.

Promote student participation during class sessions.

Attention and channeling to the corresponding area when particular problems are detected.

Analysis of formative activities that promote solidarity and collaborative support with students (peer tutoring).

Generation of a reading and reasoning circle that motivates students to learn.

5.   Tutorial intervention:

Based on the results obtained on the causes of low academic performance by students and in order to give timely follow-up to the cases, it is proposed: Implement activities of integration, accompaniment and participation of students with the school community, where they can develop both their cognitive skills and their psycho-emotional growth and maturation.

To carry out punctual, continuous and constant accompaniment of the detected students.

Conducting educational events that address issues such as addictions, hygiene, safety, emotional management, family problems.

Promote institutional identity. Promote ethical and moral values.

6.   Updating and teacher training.

Promote training within the academic staff in technical, pedagogical and human development areas.

Conclusion

As stated by Elías, (2021), promoting quality education is the commitment of every institution of higher education, whether public or private, to achieve this goal, strategies must be implemented that reflect the concern for addressing the situations that cause conflicts in students and that not only lead to poor school performance but also to a possible dropout, this implies that the strategies must be comprehensive, so that both academic, socioemotional, cultural and physical needs of students and teachers are involved.

The present proposal arises from the need to improve the academic performance of engineering students at the aforementioned university, it is true that the social and health situations that occurred in recent years in Puebla, generated a serious academic delay, which has been dragging level after level, but it is time to implement strategies to remedy the problems that our students have, in the three and a half years they spend preparing in their career should be achieved the development of knowledge, skills, attitudes and aptitudes that they can use to enter the workplace or in the next higher academic degree.

Mathematical competence is more than just solving an exercise in the subject area of mathematics, it is developing critical thinking, it is a way of identifying real problems, modeling them, proposing possible solutions, interpreting the results and proposing improvement strategies, applying mathematical reasoning.

The National Institute for the Evaluation of Education, (2018), stated that the most important part of education is the formation of useful individuals in the labor market, who are able to actively engage as citizens.

SÁNCHEZ-LÓPEZ, Guillermina, SALGADO-SUÁREZ, Gladys Denisse, CONDE-SÁNCHEZ, José Rubén and MORENO-AGUILAR, Ma. Antonia. Proposal for educational intervention in the face of external aspects that prevent the development of mathematical competence in the training of engineers. Journal of Technical Education. 2023

Therefore, it is necessary to implement both learning environments and intervention strategies in Universities with the aim of increasing the performance of future graduates and that they are able to achieve metacognition of all the knowledge achieved during their comprehensive training.

Long-term perspectives

It is expected that after the first year of implementing this intervention proposal, the results obtained will be evaluated in order to maintain the actions that worked and correct the strategies that failed.

References

Díaz, A. (2006). El enfoque por competencias en la educación, ¿una alternativa o un disfraz de cambio? Ciudad de México: Perfiles Educativos

Elías Segura, Omar Alexis. (2021). Propuesta de intervención educativa ante los aspectos sociales que repercuten en la formación de los alumnos de educación media superior. Sociológica (México), 36(102), 263-278. Epub 13 de septiembre de 2021. Recuperado en 29 de junio de 2023, de http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0187-01732021000100263&lng=es&tlng=es.

Rodríguez Lagunas, Javier, Leyva Piña, Marco A., & Hernández Vázquez, Juan Manuel. (2020). La reforma de la educación superior en México, entre la espada y la pared. La mirada de los universitarios. Polis, 16(1), 7-31. Epub 02 de octubre de 2020. https://doi.org/10.24275/uam/izt/dcsh/polis/2020v16n1/rodriguez

Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura (UNESCO, 1998). Conferencia Mundial sobre Educación Superior. La educación superior en el siglo XXI: Visión y acción. París: UNESCO. http://www.unesco.org/education/educprog/wche/declaration_spa.htm

OCDE (2004b). On the Edge. Securing a Sustainable future for Higher Education (OECD Education Working Papers), 7. OECD. Organización para la Cooperación y el Desarrollo Económicos (OECD por sus siglas en inglés) (2019). Trends Shaping Education 2019. París: OECD Publishing

Feasibility and relevance study for the opening educational programs at the bachelor's level of the Technological Institute of La Paz

Estudio de factibilidad y pertinencia para la apertura de programas educativos a nivel licenciatura de Instituto Tecnológico de La Paz

VERGARA-GARIBALDI, María Olivia†*, VILLEGAS-BARBA, María Jesús, MENDOZA-OSUNA Evangelina and YEPEZ-CASTILLO, Grecia Esmeralda

Tecnológico Nacional de México- Instituto Tecnológico de La Paz, México.

ID 1st Author: *María Olivia, Vergara-Garibaldi* / **ORC ID**: 0009-0001-9472-5218, **CVU CONAHCYT ID:** 407321

ID 1st Co-author: *María Jesús, Villegas-Barba* / **ORC ID**: 0009-0008-4911-8065, **CVU CONAHCYT ID:** 466107

ID 2nd Co-author: *Evangelina, Mendoza-Osuna* / **ORC ID:** 0009-0003-1645-2335, **CVU CONAHCYT ID:** 1319784

ID 3rd Co-author: *Grecia Esmeralda, Yepez-Castillo* / **ORC ID:** 0009-0003-9159-494X, **CVU CONAHCYT ID:** 1236745

Abstract

It's important to mention that the study was carried out under two aspects: Field and documentary research. It contains three fundamental items that make up the evaluation criteria and help to elaborate a diagnosis and evaluation of the environment of the Technological Institute of La Paz. These three items, as central core, for the feasibility and belonging of the opening of a new educational program are: Socioeconomic Factors, Institutional Factors and Development Perspectives. The methodology consisted of a quantitative research of a descriptive type, whose objective was to detect the demand of High School students, ITLP Graduates and the Productive Sector of the State of Baja California Sur. Of the options of Educational Programs in which the three interest groups coincided - gastronomy, Management Engineering, Mechatronics Engineering, Biomedical Engineering, Biotechnological Engineering, Chemical Engineering, Nanotechnology Engineering, Renewable Energy Engineering, Tourism Degree-, any of them would contribute to the 6 strategic areas of the TecNM in which the lines of research are concentrated.

Resumen

Es importante mencionar que el presente estudio se llevó a cabo bajo dos vertientes: investigación de campo y documental. Contiene tres rubros fundamentales que conforman los criterios de evaluación y ayudan a elaborar un diagnóstico y evaluación del entorno del Instituto Tecnológico de La Paz. Estos tres rubros, como núcleos centrales, para la factibilidad y pertenencia de la apertura de un nuevo programa educativo son: Factores Socioeconómicos, Factores Institucionales y Perspectivas de desarrollo. La metodología consistió en una investigación cuantitativa de tipo descriptivo, cuyo objetivo fue detectar la demanda de los estudiantes de Escuelas de Nivel Medio Superior, de Egresados del ITLP y del Sector Productivo del Estado de Baja California Sur. Conclusión. De las opciones de Programas Educativos en los que coincidieron los tres grupos de interés – gastronomía, Ingeniería en Administración, Ingeniería Mecatrónica, Ingeniería Biomédica, Ingeniería Biotecnológica, Ingeniería Química, Ingeniería en Nanotecnología, Ingeniería en Energías Renovables, Licenciatura en Turismo-, cuales quiera de ellas aportarían a las 6 áreas estratégicas del TecNM en las cuales se concentran las líneas de investigación.

Feasibility, Pertinence, Educational Programs   **Factibilidad, Pertinencia, Programas Educativos**

---

* Correspondence from the author: (E-mail: maria.vg@lapaz.tecnm.mx)
† Researcher contributing as first author.

Introduction

We are in a society in constant change and that is why we are interested in knowing what young people want to study in upper secondary schools. Do we have educational programmes that meet the needs of students with respect to the academic training they seek and in which they wish to dedicate themselves?

This is why we undertook the task of carrying out this research: Study of feasibility and relevance for the opening of educational programs at the undergraduate level of the Instituto Tecnológico de La Paz.

As part of the objectives, they are made up of 4 criteria: Analysis of the environment, social policy, economic policy and student demand.

The importance lies in knowing if the Instituto Tecnológico de La Paz has an educational offer relevant to the needs of the state of Baja California Sur.
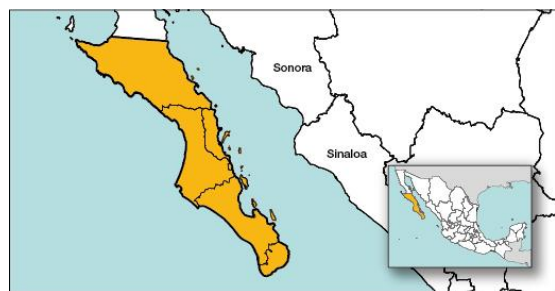

Figure 1 Map
Source:
https://www.inegi.org.mx/app/areasgeograficas/?ag=03#collapse-Resumen

In the year 2020 its population was 798,447 people. Its schooling is 10.3 years.

Feasibility and relevance study for the opening of undergraduate educational programmes at the Instituto Tecnológico de La Paz.

In most developing countries, children and adolescents already constitute the majority of the population.

This demographic dividend represents the most valuable force we have in shaping a better world for all and provides us with an unparalleled opportunity to make rapid progress on the Sustainable Development Goals (SDGs).

Young people will be the people who will lead the future, the decision-makers of the country. The state of Baja California Sur has 4,485 young people who are due to enter high school in 2019 and 5,213 first year students who are due to enter school in 2020. These students are distributed in the 5 municipalities of our state: Los Cabos, La Paz, Comondú, Loreto, Mulegé, La Paz, Comondú, Loreto and Mulegé.
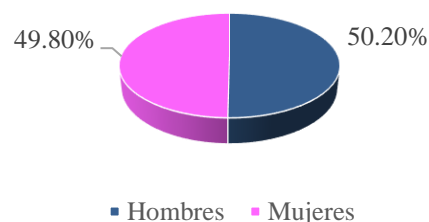
Graphic 1
Source: Own elaboration

A study was carried out in which young people from high schools in the 5 municipalities of the state of Baja California Sur were surveyed and the following results were obtained:

The demand of young people in the high schools is:

Student demand for higher education careers in the state of Baja California Sur	
CARRERA	**%**
Computer Engineering	1.80%
Information and Communications Technology Engineering	2.00%
Electrical Engineering	2.00%
Nanotechnology Engineering	2.00%
Bachelor of Science in Biology	2.20%
Chemical Engineering	2.60%
Biomedical Engineering	3.00%
Biotechnology Engineering	6.00%
Mechatronics Engineering	6.60%
Computer Systems Engineering	8.00%
Renewable Energy Engineering	8.20%
Management Engineering	9.00%
Gastronomy	10.00%
Bachelor's Degree in Tourism	12.00%
Other (specify)	24.60%
** Other: Medicine, Psychology, Law	

Table 1 Demand
Source: Own elaboration

VERGARA-GARIBALDI, María Olivia, VILLEGAS-BARBA, María Jesús, MENDOZA-OSUNA Evangelina and YEPEZ-CASTILLO, Grecia Esmeralda. Feasibility and relevance study for the opening educational programs at the bachelor's level of the Technological Institute of La Paz. Journal of Technical Education. 2023

Student demand for higher education careers in the state of Baja California Sur

Otro (especifique)	24.60%
Licenciatura en Turismo	12.00%
Gastronomía	10.00%
Ingeniería en Administración	9.00%
Ingeniería en Energías…	8.20%
Ingeniería en Sistemas…	8.00%
Ingenería en Mecatrónica	6.60%
Ingeniería en Biotecnología	6.00%
Ingeniería Biomédica	3.00%
Ingeniería Química	2.60%
Licenciatura en Biología	2.20%
Ingeniería Nanotecnología	2.00%
Ingeniería Eléctrica	2.00%
Ingeniería en Tecnologías de…	2.00%
Ingeniería en informática	1.80%

Graphic 2 Demand
Source: Own elaboration

It can be seen that young people are interested in the option of Others, with the most requested degrees being medicine, psychology and law. These degrees are not offered by the Tecnológico Nacional de México (TecNM) or the Instituto Tecnológico de La Paz (ITLP). The following are: Bachelor's Degree in Tourism 12%, Gastronomy 10%, Engineering in Administration 9%, Engineering in Renewable Energies 8.20%, Engineering in Computer Systems 8%, Engineering in Mechatronics 6.6%, Engineering in Biotechnology 6%, these being the most in demand by young people in high schools or at the upper secondary level of education.
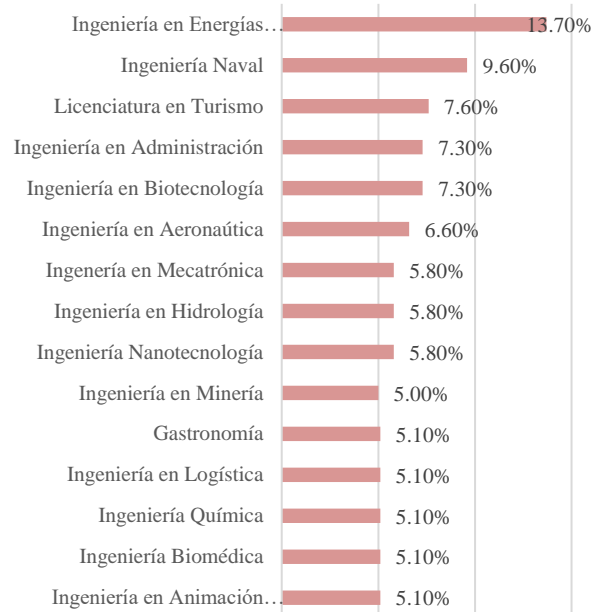
The demand from young people who have already graduated from one of the 9 degree courses at the Instituto Tecnológico de La Paz is for both bachelor's and master's degrees:

Demand for careers by graduates of the Instituto Tecnológico de La Paz	
CAREER	%
Digital Animation and Visual Effects Engineering	5.10%
Biomedical Engineering	5.10%
Chemical Engineering	5.10%
Logistics Engineering	5.10%
Gastronomy	5.10%
Mining Engineering	5.00%
Nanotechnology Engineering	5.80%
Hydrology Engineering	5.80%

Mechatronics Engineering	5.80%
Aeronautical Engineering	6.60%
Biotechnology Engineering	7.30%
Management Engineering	7.30%
Bachelor's Degree in Tourism	7.60%
Naval Engineering	9.60%
Renewable Energy Engineering	13.70%

Table 2 Demand
Source: Own elaboration

Demand for careers by graduates of the Instituto Tecnológico de La Paz

Ingeniería en Energías…	13.70%
Ingeniería Naval	9.60%
Licenciatura en Turismo	7.60%
Ingeniería en Administración	7.30%
Ingeniería en Biotecnología	7.30%
Ingeniería en Aeronaútica	6.60%
Ingenería en Mecatrónica	5.80%
Ingeniería en Hidrología	5.80%
Ingeniería Nanotecnología	5.80%
Ingeniería en Minería	5.00%
Gastronomía	5.10%
Ingeniería en Logística	5.10%
Ingeniería Química	5.10%
Ingeniería Biomédica	5.10%
Ingeniería en Animación…	5.10%

Graphic 3 Demand
Source: Own elaboration

The careers with the highest demand from young graduates of the Instituto Tecnológico de La Paz are Engineering in Renewable Energies 13.7%, Naval Engineering 9.60%, Bachelor's Degree in Tourism 7.6%, Engineering in Administration 7.3%, Engineering in Biotechnology 7.3%, Engineering in Aeronautics 6.6%, and Engineering in Aeronautics 6.6%.
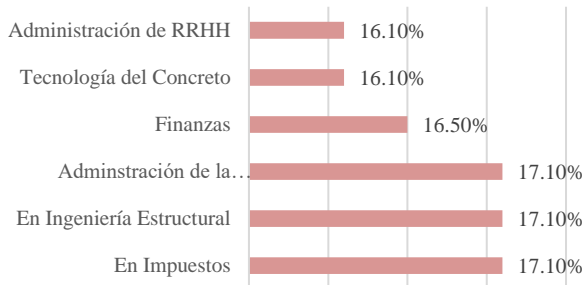
Demand for Master's Degrees by graduates of the Instituto Tecnológico de La Paz	
MA	%
In Taxation	17.10%
In Structural Engineering	17.10%
Construction Management	17.10%
Finance	16.50%
Concrete Technology	16.10%
Human Resources Management	16.10%

Table 3 Demand
Source: Own elaboration

VERGARA-GARIBALDI, María Olivia, VILLEGAS-BARBA, María Jesús, MENDOZA-OSUNA Evangelina and YEPEZ-CASTILLO, Grecia Esmeralda. Feasibility and relevance study for the opening educational programs at the bachelor's level of the Technological Institute of La Paz. Journal of Technical Education. 2023

With regard to the Master's degrees offered by the Instituto Tecnológico de La Paz, 65.6% of those surveyed wish to continue their training in the classroom mode. The Master's degrees that graduates of the Instituto Tecnológico de La Paz are requesting are:

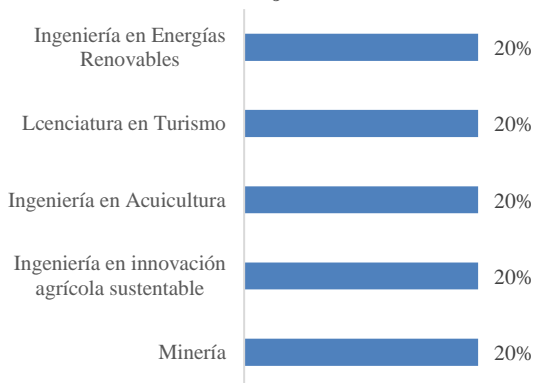**Demand for Master's Degrees by graduates of the Instituto Tecnológico de La Paz**

Administración de RRHH	16.10%
Tecnología del Concreto	16.10%
Finanzas	16.50%
Adminstración de la…	17.10%
En Ingeniería Estructural	17.10%
En Impuestos	17.10%

Graphic 4 Demand
Source: Own elaboration

And finally, the business sector demanded the following degrees and master's programs:

Demand careers the Business Sector of the state of Baja California Sur	
CAREER	%
Mining Engineering	20%
Sustainable Agricultural Innovation Engineering	20%
Aquaculture Engineering	20%
Bachelor in Tourism	20%
Renewable Energy Engineering	20%

Table 4 Demand
Source: Own elaboration

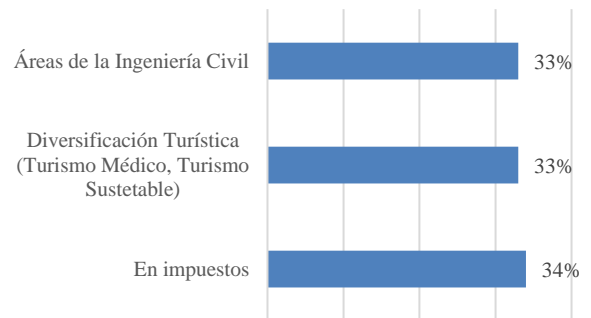**Demand careers the Business Sector of the state of Baja California Sur**

Ingeniería en Energías Renovables	20%
Lcenciatura en Turismo	20%
Ingeniería en Acuicultura	20%
Ingeniería en innovación agrícola sustentable	20%
Minería	20%

Graphic 5 Demand
Source: Own elaboration

Baja California Sur's Business Sector Demands Master's Degrees	
MASTERS	%
In Taxation	34%
Tourism Diversification (Medical Tourism, Sustainable Tourism)	33%
Areas of Civil Engineering	33%

Table 5 Demand
Source: Own elaboration

Baja California Sur's Business Sector Demands Master's Degrees

|	
Áreas de la Ingeniería Civil	33%
Diversificación Turística (Turismo Médico, Turismo Sustetable)	33%
En impuestos	34%

Graphic 6 Demand
Source: Own elaboration

Methodology

The methodology used was quantitative with descriptive analysis.

Results

The results obtained through the surveys applied to the young students of the schools of the Medium Higher Education Level, the Graduates of the Technological Institute of La Paz and the Business Sector:
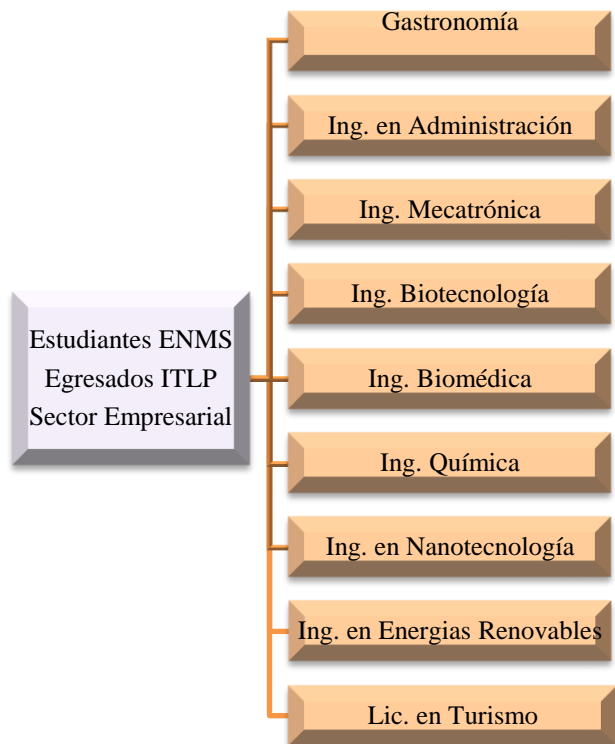
Graphic 1 Results
Source: Own elaboration

The Institutional Factors are all the updated internal variables of the Instituto Tecnológico de La Paz (ITLP), the updated situation in terms of its human, financial and material resources, as well as an analysis of the academic work of the Institute, such as the attention to demand, the evolution of school enrolment and links with the productive sector. These factors are made up of 6 criteria: Human Resources (personnel), Financial Resources, Infrastructure for the attention of the programmes, Students, Linkage, Management, Human Resources (Personnel).

With respect to the academic structure of the teaching staff, the following are considered to exist:

ITLP - Academic structure	
Teachers	
Speciality	7
Bachelor's degree	121
Master's degree	82
Doctorate	12
Full-time	113
3/4 Full Time	19
1/2 Time	7
Subject	83
DFDCD	58
DFT	52
Average age	51

Table 1
Source: Own elaboration
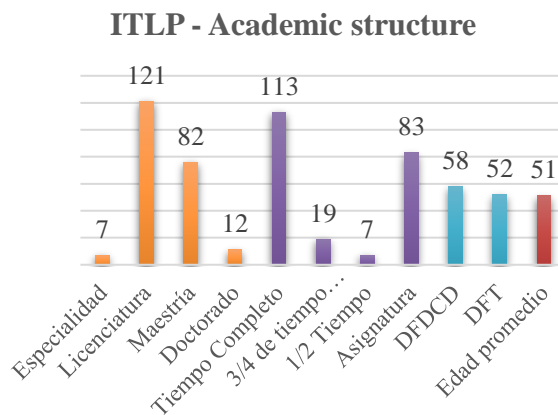
Graphic 2
Source: Own elaboration

Of the 222 teachers and with the aim of having teachers who are up to date in the use of technologies, techniques and methods in current use in the industry, as well as with the teaching skills to create significant knowledge for students. 87% have participated in teacher training courses and 68% in professional updating courses; 87% have participated in teacher training courses and 68% in professional updating courses. There are 52 teachers who have been certified in tutoring in upper secondary and higher education (EC 0477) or in teacher training courses that qualify them as tutors, and 58 teachers have been trained in the Diploma for the Formation of Basic Teaching Competences (DFCBD).

The Instituto Tecnológico de La Paz has an annual budget, the origin of the resources with which it operates comes from three sources and thus guarantees the sustainability and development of the Educational Programmes.

It presents 3 performance indicators: Federal Resources, State Resources, Municipal Resources.

Infrastructure for the attention of the programme, The Technological Institute of La Paz is constituted by: 40 buildings, 64 classrooms built and used as such, 13 laboratories, 7 workshops, 8 sports facilities.
With respect to students, an analysis of the last five years of the evolution of enrolment, absorption rate (applicants/accepted) is shown),

ITLP - Contribution to national enrolment (Bachelor)						
Registration ITLP	2015	2016	2017	2018	2019	2020
Men	64%	63%	61%	60%	60%	59%
Women	36%	37%	39%	40%	40%	41%

Table 2
Source: Own elaboration

Accredited Educational Programmes or those recognised for their good quality in the institution. Continuous improvement is a premise that regulates development in the different areas of our institution. Evaluation by external bodies is an opportunity to offer relevant professional preparation to students. The new criteria for evaluation by accrediting bodies represent a niche of opportunity for the Educational Programmes through which the impact of the graduates in the labour market can be measured and fed back, in the current year, the enrolment of 3 degree programmes offered, are enrolled in Bachelor's Degree Educational Programmes accredited for their high quality.

Figure 2 Accreditation of Bachelor's Degree in Management

Figure 1 Accreditation of certified public accountants

Figure 3 Accreditation in Business Management

The linkage is the relationship of mutual benefits between the institution and its surroundings, in the business, educational, social and environmental sectors, to strengthen the student's labour and professional competences. The Instituto Tecnológico de La Paz has signed 51 collaboration agreements; with the primary sector it has signed: 1 agreement, with the secondary sector: 5 and with the tertiary sector: 45; 3 agreements are valid until 2020 and another 3 until 2021, 9 until 2022, 1 agreement is valid until 2023, 10 until 2024 and 25 are valid indefinitely; the above shows that there is a formal and effective relationship with industry and other social actors and that there are concrete benefits for the students.

The follow-up of graduates presented in this analysis corresponds to the years 2018 and the first semester of 2019, and shows the following analysis: 60% of the graduates are graduates, 43% work in activities that are related to the graduate profile, 18% work in activities that are not related to the graduate profile and 39% state that they do not work. With regard to the economic sector in which they work, 13% of the graduates work in large companies, 19% in medium-sized companies, 43% in small companies and 25% in micro-companies. 74% of the graduates say that the emphasis given to research in the teaching process was good to very good, 22% considered it to be average. 84% expressed interest in continuing postgraduate studies. Satisfaction with the infrastructure was rated by 84% of the graduates as fair to very good and 15% as poor. The objective of the professional residency is to provide students with the opportunity to solve problems presented by public or private initiatives. 99% stated that the experience was satisfactory. The opinion on the efficiency to carry out the work activities is between efficient and very efficient with a qualification of 99%, finally, the graduate qualifies his academic training with respect to his work performance with 38% excellent, and between good and fair with 61%.

Acknowledgements

Conclusions

Two recommendations are presented, the first one is based on the review of the National Development Plan 2019-2024, the State Development Plan 2015-2021, the Tourism Sector Programme 2015-2021, the Education Sector Programme 2015-2021, the State and Economic Information of Baja California Sur, it is detected that in terms of national policy tourism, the construction sector, private financial services, become a priority. In the field of tourism in 2017, Baja California Sur registered an entry of 1,677,406 foreign tourists; in the tertiary sector, there is a national contribution of 67.7% for services, including construction services.

The second recommendation is based on the strategic areas covered by the Tecnológico Nacional de México, where after the analysis of the options of Educational Programmes in which the three groups of interest coincided - gastronomy, Engineering in Administration, Mechatronics Engineering, Biomedical Engineering, Biotechnological Engineering, Chemical Engineering, Nanotechnology Engineering, Engineering in Renewable Energies, Degree in Tourism - which of these would contribute to the 6 strategic areas of the TecNM in which the lines of research are concentrated.

The Tecnológico Nacional de México / Instituto Tecnológico de La Paz has the opportunity to propose new Educational Programmes of Bachelor's Degrees, specialities or, through the Division of Postgraduate Studies and Research, Master's Degrees or Doctorates that are linked to the tertiary sector, and thus provide the opportunity for graduates of the Educational Programmes of Architecture, Civil Engineering, and Electromechanical Engineering, Civil Engineering and Electromechanical Engineering to continue with their academic training, with the aim of enhancing their knowledge and meet the needs of the tertiary sector, which is the main source of income for Baja California Sur, and the educational programmes of the Instituto Tecnológico de La Paz are oriented towards this sector.

References

B.C.S., G. d. (s.f.). *Plan de Desarrollo Estatal 2015-2021.*

México, G. d. (s.f.). *Plan Nacional de Desarrollo 2019-2024.* Ciudad México.

México, G. d. (s.f.). *Programa Sectorial de Turismo 2015 - 2021.*

Pública, S. d. (s.f.). *Programa Sectorial de Educación 2015 - 2021.*

16/08/2023
https://www.inegi.org.mx/

17/08/2023
https://framework-gb.cdn.gob.mx/landing/documentos/PND.pdf

http://setuesbcs.gob.mx/wp-content/uploads/2018/04/PED-2015-2021.pdf

https://www.planeacion.sep.gob.mx/Doc/planeacion/mediano_plazo/pse_2020_2024.pdf

https://www.gob.mx/cms/uploads/attachment/file/43340/Baja_California_Sur.pdf.

[Title in Times New Roman and Bold No. 14 in English and Spanish]

Surname (IN UPPERCASE), Name 1st Author†*, Surname (IN UPPERCASE), Name 1st Coauthor, Surname (IN UPPERCASE), Name 2nd Coauthor and Surname (IN UPPERCASE), Name 3rd Coauthor

Institutional Affiliation of Author including Dependency (No.10 Times New Roman and Italic)

International Identification of Science - Technology and Innovation

ID 1st Author: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 1st author: (Scholar-PNPC or SNI-CONACYT) (No.10 Times New Roman)

ID 1st Co-author: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 1st co-author: (Scholar or SNI) (No.10 Times New Roman)

ID 2nd Co-author: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 2nd co-author: (Scholar or SNI) (No.10 Times New Roman)

ID 3rd Co-author: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 3rd co-author: (Scholar or SNI) (No.10 Times New Roman)

Abstract (In English, 150-200 words)

Objectives
Methodology
Contribution

Keywords (In English)

Indicate 3 keywords in Times New Roman and Bold No. 10

Abstract (In Spanish, 150-200 words)

Objectives
Methodology
Contribution

Keywords (In Spanish)

Indicate 3 keywords in Times New Roman and Bold No. 10

Citation: Surname (IN UPPERCASE), Name 1st Author, Surname (IN UPPERCASE), Name 1st Coauthor, Surname (IN UPPERCASE), Name 2nd Coauthor and Surname (IN UPPERCASE), Name 3rd Coauthor. Paper Title. Revista de Educación Técnica. Year 1-1: 1-11 [Times New Roman No.10]

---

* Correspondence to Author (example@example.org)
† Researcher contributing as first author.

Introduction

Text in Times New Roman No.12, single space.

General explanation of the subject and explain why it is important.

What is your added value with respect to other techniques?

Clearly focus each of its features

Clearly explain the problem to be solved and the central hypothesis.

Explanation of sections Article.

## Development of headings and subheadings of the article with subsequent numbers

[Title No.12 in Times New Roman, single spaced and bold]

Products in development No.12 Times New Roman, single spaced.

Including graphs, figures and tables-Editable

In the article content any graphic, table and figure should be editable formats that can change size, type and number of letter, for the purposes of edition, these must be high quality, not pixelated and should be noticeable even reducing image scale.

[Indicating the title at the bottom with No.10 and Times New Roman Bold]
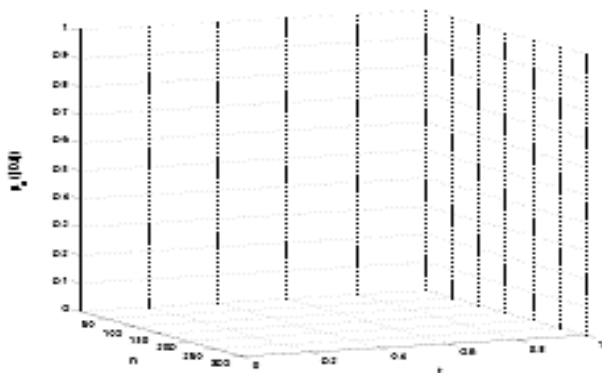
Graphic 1 Title and *Source (in italics)*
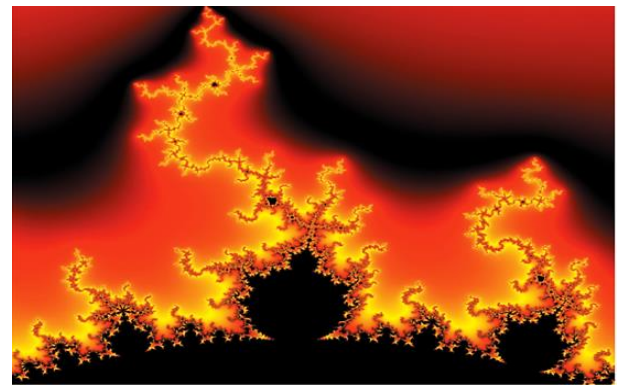
Should not be images-everything must be editable.

Figure 1 Title and *Source (in italics)*

Should not be images-everything must be editable.

Table 1 Title and *Source (in italics)*

Should not be images-everything must be editable.

Each article shall present separately in **3 folders**: a) Figures, b) Charts and c) Tables in .JPG format, indicating the number and sequential Bold Title.

For the use of equations, noted as follows:

$$Y_{ij} = \alpha + \sum_{h=1}^{r} \beta_h X_{hij} + u_j + e_{ij} \qquad (1)$$

Must be editable and number aligned on the right side.

Methodology

Develop give the meaning of the variables in linear writing and important is the comparison of the used criteria.

Results

The results shall be by section of the article.

Annexes

Tables and adequate sources

Thanks

Indicate if they were financed by any institution, University or company.

Conclusions

Explain clearly the results and possibilities of improvement.

References

Use APA system. Should not be numbered, nor with bullets, however if necessary numbering will be because reference or mention is made somewhere in the Article.

Use Roman Alphabet, all references you have used must be in the Roman Alphabet, even if you have quoted an Article, book in any of the official languages of the United Nations (English, French, German, Chinese, Russian, Portuguese, Italian, Spanish, Arabic), you must write the reference in Roman script and not in any of the official languages.

Technical Specifications

Each article must submit your dates into a Word document (.docx):

Journal Name
Article title
Abstract
Keywords
Article sections, for example:

1. Introduction
2. Description of the method
3. Analysis from the regression demand curve
4. Results
5. Thanks
6. Conclusions
7. References

Author Name (s)
Email Correspondence to Author
References

Intellectual Property Requirements for editing:

- Authentic Signature in color of <u>Originality Format</u> Author and Co-authors.

- Authentic Signature in color of the <u>Acceptance Format</u> of Author and Co-authors.

- Authentic Signature in blue color of the <u>Conflict of Interest Format</u> of Author and Co-authors.

Reservation to Editorial Policy

Journal of Technical Education reserves the right to make editorial changes required to adapt the Articles to the Editorial Policy of the Research Journal. Once the Article is accepted in its final version, the Research Journal will send the author the proofs for review. ECORFAN® will only accept the correction of errata and errors or omissions arising from the editing process of the Research Journal, reserving in full the copyrights and content dissemination. No deletions, substitutions or additions that alter the formation of the Article will be accepted.

11.-Code of Ethics - Good Practices and Declaration of Solution to Editorial Conflicts

Declaration of Originality and unpublished character of the Article, of Authors, on the obtaining of data and interpretation of results, Acknowledgments, Conflict of interests, Assignment of rights and Distribution

The ECORFAN-Mexico, S.C Management claims to Authors of Articles that its content must be original, unpublished and of Scientific, Technological and Innovation content to be submitted for evaluation.

The Authors signing the Article must be the same that have contributed to its conception, realization, and development, as well as obtaining the data, interpreting the results, drafting and reviewing it. The Corresponding Author of the proposed Article will request the form that follows.

Article title:

– The sending of an Article to Journal of Technical Education emanates the commitment of the author not to submit it simultaneously to the consideration of other series publications for it must complement the Format of Originality for its Article, unless it is rejected by the Arbitration Committee, it may be withdrawn.

– None of the data presented in this article has been plagiarized or invented. The original data are clearly distinguished from those already published. And it is known of the test in PLAGSCAN if a level of plagiarism is detected Positive will not proceed to arbitrate.

– References are cited on which the information contained in the Article is based, as well as theories and data from other previously published Articles.

– The authors sign the Format of Authorization for their Article to be disseminated by means that ECORFAN-Mexico, S.C. In its Holding Republic of Peru considers pertinent for disclosure and diffusion of its Article its Rights of Work.

– Consent has been obtained from those who have contributed unpublished data obtained through verbal or written communication, and such communication and Authorship are adequately identified.

– The Author and Co-Authors who sign this work have participated in its planning, design and execution, as well as in the interpretation of the results. They also critically reviewed the paper, approved its final version and agreed with its publication.

– No signature responsible for the work has been omitted and the criteria of Scientific Authorization are satisfied.

– The results of this Article have been interpreted objectively. Any results contrary to the point of view of those who sign are exposed and discussed in the Article.

Copyright and Access

Article Title:

Name and Surnames of the Contact Author and the Co-authors	Signature
1.	
2.	
3.	
4.	

Principles of Ethics and Declaration of Solution to Editorial Conflicts

Editor Responsibilities

The Publisher undertakes to guarantee the confidentiality of the evaluation process, it may not disclose to the Arbitrators the identity of the Authors, nor may it reveal the identity of the Arbitrators at any time.

The Editor assumes the responsibility to properly inform the Author of the stage of the editorial process in which the text is sent, as well as the resolutions of Double-Blind Review.

The Editor should evaluate manuscripts and their intellectual content without distinction of race, gender, sexual orientation, religious beliefs, ethnicity, nationality, or the political philosophy of the Authors.

The Editor and his editing team of ECORFAN® Holdings will not disclose any information about Articles submitted to anyone other than the corresponding Author.

The Editor should make fair and impartial decisions and ensure a fair Double-Blind Review.

Responsibilities of the Editorial Board

The description of the peer review processes is made known by the Editorial Board in order that the Authors know what the evaluation criteria are and will always be willing to justify any controversy in the evaluation process. In case of Plagiarism Detection to the Article the Committee notifies the Authors for Violation to the Right of Scientific, Technological and Innovation Authorization.

Responsibilities of the Arbitration Committee

The Arbitrators undertake to notify about any unethical conduct by the Authors and to indicate all the information that may be reason to reject the publication of the Articles. In addition, they must undertake to keep confidential information related to the Articles they evaluate.

Any manuscript received for your arbitration must be treated as confidential, should not be displayed or discussed with other experts, except with the permission of the Editor.

The Arbitrators must be conducted objectively, any personal criticism of the Author is inappropriate.

The Arbitrators must express their points of view with clarity and with valid arguments that contribute to the Scientific, Technological and Innovation of the Author.

The Arbitrators should not evaluate manuscripts in which they have conflicts of interest and have been notified to the Editor before submitting the Article for Double-Blind Review.

Responsibilities of the Authors

Authors must guarantee that their articles are the product of their original work and that the data has been obtained ethically.

Authors must ensure that they have not been previously published or that they are not considered in another serial publication.

Authors must strictly follow the rules for the publication of Defined Articles by the Editorial Board.

The authors have requested that the text in all its forms be an unethical editorial behavior and is unacceptable, consequently, any manuscript that incurs in plagiarism is eliminated and not considered for publication.

Authors should cite publications that have been influential in the nature of the Article submitted to arbitration.

Information services

Indexation - Bases and Repositories

LATINDEX (Scientific Journals of Latin America, Spain and Portugal)
EBSCO (Research Database - EBSCO Industries)
RESEARCH GATE (Germany)
GOOGLE SCHOLAR (Citation indices-Google)
MENDELEY (Bibliographic References Manager)
HISPANA (Information and Bibliographic Orientation-Spain)

Publishing Services

Citation and Index Identification H
Management of Originality Format and Authorization
Testing Article with PLAGSCAN
Article Evaluation
Certificate of Double-Blind Review
Article Edition
Web layout
Indexing and Repository
ArticleTranslation
Article Publication
Certificate of Article
Service Billing

Editorial Policy and Management

1047 La Raza Avenue -Santa Ana, Cusco-Peru. Phones: +52 1 55 6159 2296, +52 1 55 1260 0355, +52 1 55 6034 9181; Email: contact@ecorfan.org www.ecorfan.org

Journal of Technical Education

"Perception of the students of the Human Capital Administration career on the return to face-to-face classes"
RUIZ-ESPARZA-OCHOA, Sandra, SÁNCHEZ-SOTO, Claudia, RAMÍREZ-SILVA, Macario Alejandro and JUÁREZ-HERNÁNDEZ, Sandra Elizabeth
Universidad Tecnológica de León

"Development and implementation of the academic portal for optimization of services"
ROURA-VÉLEZ, Ernesto, RODRÍGUEZ-CAMPOS, Juan Carlos, RICO-CHAGOLLÁN, Mariana and VIDAL-ORTIZ, Gabriela

"Proposal for educational intervention in the face of external aspects that prevent the development of mathematical competence in the training of engineers"
SÁNCHEZ-LÓPEZ, Guillermina, SALGADO-SUÁREZ, Gladys Denisse, CONDE-SÁNCHEZ, José Rubén and MORENO-AGUILAR, Ma. Antonia
Universidad Tecnológica de Puebla

"Feasibility and relevance study for the opening educational programs at the bachelor's level of the Technological Institute of La Paz"
VERGARA-GARIBALDI, María Olivia, VILLEGAS-BARBA, María Jesús, MENDOZA-OSUNA Evangelina and YEPEZ-CASTILLO, Grecia Esmeralda
Instituto Tecnológico de La Paz