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# **Journal of University Policies**

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## **Presentation of Content**

In a first article we present, *Resistances, results and learning from Organizational Change. The case of the Higher Education Institution in central Mexico*, by MARTÍ-REYES, Mireya, CERVERA-DELGADO, Cirila and DE LA SANCHA-VILLA, Enoc Obed, with ascription in Universidad de Guanajuato, a next article we present, *Vocational Decision Making and Anxiety during the Coronavirus 19 Pandemic*, by LOZANO-GUTIÉRREZ, Jorge Luis, PACHECO-AMIGO, Beatriz Mabel, SOLÍS-RECÉNDEZ, Emma Perla and RODRÍGUEZ-GARCÍA, Francisco Javier, with ascription in Universidad Autónoma de Zacatecas, a next article we present *COVID-19 pandemic: Virtual technology applied to higher education at CU UAEM Valle de México and Ecatepec*, by RUIZ-REYNOSO, Adriana Mercedes, RAMÍREZ-CORTES, Verónica and HERRERA-HERNÁNDEZ, Héctor, with ascription in Universidad Autónoma del Estado de México, México, a last article we present *Strategies to promote university permanence in times of COVID-19*, by KATT-MORALES, Luz Alondra, DOMINGUEZ-CAMPOMANES, Margarita, GOMEZ-MANUEL, Esbeidy and MORALES-REYES, Eunice, with ascription in Universidad Tecnológica del Sureste de Veracruz.

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## Resistances, results and learning from Organizational Change. The case of the Higher Education Institution in central Mexico

### Resistencia, resultados y aprendizajes del Cambio Organizacional. El caso de una Institución de Educación Superior del centro de México

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#### Abstract

Organizational change processes are constant and inherent not only in organizations, but in life itself. In this particular case, we will refer to a public institution of higher education (IES) in central Mexico which, as of January 2009, began to operate with a new academic-administrative structure, going from a Napoleonic model to one matrix-departmental-multicampus. Although it seems simple, although the legal-normative process involved difficulties, they were not as many as the resistance that has been experienced since then, and the lessons learned to achieve the transformation that, indisputably, represents this proposal in the academic field. In this work, the results of an investigation dedicated to the analysis of this change and its relationships with the organizational culture will be reported. For the development of this project, documentary research, classical methods such as analysis-synthesis and self-observation were used; all this, with the aim of reflecting on the administrative, labor, academic and personal implications of an organizational change of this magnitude. Likewise, a brief description of some gaps, opened and overcome, is presented; of the learning and the indicators that show us that it is possible to advance in the realization of this organizational change.

**Organizational Change, Higher Education Institution, Organizational Culture**

#### Resumen

Los procesos de cambio organizacional son constantes e inherentes no sólo a las organizaciones, sino a la propia vida. En este caso en particular, nos referiremos a una institución de educación superior (IES) pública del centro de México la cual, a partir de enero de 2009, comenzó a operar con una nueva estructura académico-administrativa, pasando de un modelo napoleónico a uno matricial-departamental-multicampus. Aunque parezca sencillo, si bien el proceso jurídico-normativo implicó dificultades, no fueron tantas como las resistencias que se han vivido desde entonces, y los aprendizajes para llegar a concretar la transformación que, indiscutiblemente, representa esta propuesta en el ámbito académico. En este trabajo se dará cuenta de los resultados de una investigación dedicada al análisis de este cambio y sus relaciones con la cultura organizacional. Para el desarrollo de este proyecto se utilizó la investigación documental, métodos clásicos como el análisis-síntesis y la autoobservación; todo ello, con el objetivo de reflexionar sobre las implicaciones administrativas, laborales, académicas y personales de un cambio organizacional de esta envergadura. Asimismo, se presenta una breve descripción de algunas brechas, abiertas y superadas; de los aprendizajes y los indicadores que nos muestran que es posible avanzar en la concreción de este cambio organizacional.

**Cambio Organizacional, Institución de Educación Superior, Cultura Organizacional**

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† Researcher contributing as first author.

**Introduction**

*No one bathes in the river twice because everything changes in the river and in which he bathes.*

Heraclitus

When we talk about organizational change, we think of modification, movement, conversion, moving and, above all, transformation... Because change is inherent, not only in organizations, but in life itself, since every day that passes, we are a little older and, therefore, something is different.

According to the magnitude of the change, it can have implications in very different components and levels of organizational development, since it functions as a system that integrates a set of coordinated parts, in interaction or interdependence to achieve certain objectives (Johansen, 1993). Thus, in any organization, be it a company or an educational institution, when a profound change is made, it integrates both the organizational structure and the individual people, the groups and, above all, the interactions between these essential elements of Organizational Behavior, linked to the culture and dynamics of the organism in question.

In this case, we will refer to the University of Guanajuato, a public higher education institution in central Mexico which, as of January 2009, began to operate with a new academic-administrative structure, moving from a model based on schools, centers, faculties, and institutes (known as Napoleonic), in force since 1945, to a model based on Departments, Divisions and Campus (called as matrix-departmental-multicampus). Saying it this way might seem like a very simple, simple change, without major complications. However, not only did the legal-normative process involve multiple difficulties, but these were minimal in relation to those experienced, since then, by all the actors involved. Hence the importance of addressing this type of study.

Moving from a Napoleonic model to a matrix-departmental-multicampus model not only concerns the change of names or the organizational structure, but also the construction of a new paradigm in the substantive functions developed by the University:

Teaching, research, extension-dissemination and management and, fundamentally, in the distribution and activities of the main actors of the educational process: students, the reason for being of the Institution; professors, guides of academic development, and, executive authorities, who have as one of their essential faculties, to guide the work of the corresponding academic-administrative unit. All this, to concretize the indisputable transformation that this proposal represents in the academic field.

Considering the complexity and broadness of the subject, the objective of this article is to give an account of a preliminary analysis of the administrative, labor, academic and personal implications that mean living an organizational change of this magnitude in the Maximum House of Studies of the state of Guanajuato. To this end, and only as a first approach within a more comprehensive research, the present work is dedicated to the study of this transformation and its relations with the organizational culture.

In general, we opt for a qualitative inquiry, and various strategies such as documentary research, self-observation, classical methods such as analysis and synthesis, as well as the beginning of the application of Marvin Weisbord's Six Box Model are included, all of which are presented in the following section. On the other hand, in the development of the article, the links of change with the organizational culture are exposed, based on antecedents, examples and milestones of the institution studied that give it identity.

The environment, theoretical references and some challenges of change are addressed, based on institutional documents that guide and condition it. Also, as part of the results, it is analyzed: the change and the tensions that it has generated in the UG; the organizational structure from the University Normativity and, certain contradictions between change and tradition

Finally, and, by way of conclusions, a brief description of some gaps, open and overcome, and the indicators that show us that, although there is still much to do, fortunately, we are in a new stage that allows us to trust in hope and take advantage of the learning to achieve the realization of this organizational change.

## Methodology

The approach of this work has been based on qualitative research and various methodological strategies have been used, to achieve the proposed objective. In general, within a qualitative approach to research, this is conceived from a holistic perspective since the studies, oriented with greater emphasis to people in particular scenarios, are visualized as a whole, in the search for a global and not fragmented understanding because "what is expected at the end is a smooth description, an experiential understanding and multiple realities" (Álvarez-Gayou, 2006, p.29).

Likewise, educational research is flexible, data collection strategies and, even, the questions that are taken as a starting point are consolidated during the study, in which researchers approach and learn from people in their context, try to identify with these people and not be intrusive, in addition to being respectful and understanding of all perspectives and, in essence, humanists (Álvarez-Gayou, 2006). In this case, the question that has guided this work is: What have been the administrative, labor, academic and personal implications of the change in the organizational structure of the UG? In particular, among the methods used for the development of this project is documentary research, understood as the construction of knowledge from the sources, as "a way of ensuring the tradition of original thought, and bringing it to the present with a hermeneutic reading that favors discussion by making new contributions to scientific development" (Gómez, 2011, p. 230).

Around the subject in question, due to its breadth and complexity, the search for documents was oriented, not only to organizational change, but also to organizational culture, dynamics, and behavior; to what is related to the philosophy of organizations, and to models linked to the analysis, among other aspects, of the structures of institutions. Although some researchers, perhaps, do not consider documentary research as a scientific method to collect information and contribute to knowledge, we agree with Gómez (2011) that, in recent times (more for the social sciences, although not exclusively), it has become a necessity to return or to the sources, to the documents that account for the original thought or proposals, it is, to grant them due credit and contrast with other interpretative sources.

It is about dialogue with the authors and, with this search, "allowing reality itself to be expressed, with logic and arguments, thus building new knowledge" (Gómez, 2011, p. 229). Along with classical methods such as analysis and synthesis, self-observation was used, which "offers the advantage of greater depth and introspection in the meanings and core experiences" (Álvarez-Gayou, 2006, p. 108). Finally, some components of Marvin Weisbord's Six Box Model were also taken up, as a diagnostic tool for Organizational Development, which addresses both formal and informal aspects; that is, what is officially proposed and should happen, along with what is happening (French and Bell, 1996).

From this model comprising: 1. Purposes / 2. Structure / 3. Relationships / 4. Rewards / 5. Leadership, and 6. Useful mechanisms, the first two *boxes* were addressed and the beginning of the analysis of the very diverse and complex relationships between the people who make up the Institution, with their different functions and roles, as well as the main academic-administrative entities that make it up.

## Development

### **Around organizational culture: milestones to understand change at the University of Guanajuato**

It is often referred to that changes are continuous and constant processes, which concern both living beings and organizations. Therefore, it is considered that organizational change is not only inherent but imminent and implies the participation of many efforts and wills, to obtain an improvement (Pérez, Maldonado and Bustamante, 2006). However, although improvement is the goal of any change, it does not mean that it is always achieved on the first attempt, much less that the path is straight and unobstructed. What is an unquestionable fact is that organizations change, as do human beings? In Acosta's words:

*How can we not think that organizations evolve by themselves and by the effect of the environment in which they are realized, if their nature is not properly inert because, saying it sharply, the substance of them is human and in this sense, they are living organisms and are generators of thought (culture) (2002, p. 21).*

From this perspective, it should be noted that these changes in organizations are linked to organizational culture, understood as the system of meanings shared by the members of an organization, which distinguish it from others and can be considered, as in individuals, as their personality. It is a dominant culture, which expresses the main values with which most of the members of the organization identify with, and share (Robbins, s/f).

And why talk about organizational culture? For being the set of values, beliefs, knowledge, and ways of thinking in an organization. Also, because among the elements to understand the organizational culture are stories, anecdotes, legends, ceremonies, symbols ... All this is found at the macro level, both in the federative entities of the Mexican Republic, as well as in the institutions at the meso or micro level.

As for the Institution of Higher Education (IES) that concerns us, as well as in the city of Guanajuato there are multiple and very diverse stories, myths and legends that have transcended the borders of the State (that of the "Alley of the kiss" or the very famous "aunts": the mummies of Guanajuato), there are also many legends (which, sometimes, are confused with history) around the public university of the inhabitants of Guanajuato. Such is the case of the one that exists around Doña Josefa Teresa de Busto y Moya, considered the benefactor and promoter of the Hospice of the Holy Trinity (1732), where the origin of the Institution is established.

It is said that, when Doña Josefa gave up her house to found the College, there was in her room a beehive that she took with her when she moved her residence and, after her death, the bees returned to her home. From this legend were born several deep-rooted symbols, such as: that of the "Legendary Beehive"; the shield of the UG, in whose fields stand out a natural hive, a natural honeycomb and three bees, all of which symbolizes the intense joint work that characterizes us as a university community (see Figure 1), and the fact that "we are bees" (University of Guanajuato, Website, recovered from <https://www.ugto.mx/conoce-la-ug/>).

## UNIVERSIDAD DE GUANAJUATO



**Figure 1** Coat of arms of the University of Guanajuato  
Source: Taken from the Institutional Image Guide.  
<https://www.ugto.mx/imagenug/escudo-ug>

Another important symbol that gives identity to the UG is the University Anthem and, since the beginning of the lyrics by Don Fulgencio Vargas (February 1928), there are well-known iconic phrases (especially the first), not only by the community, but by authorities of different state and even national government agencies:

*Gloria y honor al viejo relicario  
Que prende en argentífero solar  
De sus aulas al nido legendario [...]*

In a brief timeline, it is worth noting that it has been recognized as a Jesuit school from 1744, and after uncertain stages and consolidation, among which its denomination as a State College (1870) stands out, the current University of Guanajuato acquired that status in 1945. Since then, it has maintained a unique organizational profile, perhaps nuanced by the recognition of its autonomy (1994).

All of the above, and many other elements, are part of a strong organizational culture, which is necessary to know because, as Robbins and Judge expressed: "A firm culture provides stability to an organization. But [...] culture doesn't go well with everyone. And for some organizations, it even becomes a major obstacle to change" (2013, p. 512).

The milestone we are dealing with began to take shape at the beginning of the 2000s and was concretized in May 2007, when the LX Constitutional Legislature of the State, approved the new Organic Law of the institution, in force from October of the same year.

With this legal instrument, and with the application of the Organic Statute (March 2008), the University proceeded to change its Napoleonic organizational structure to one of a matrix-departmental-multicampus nature.

In the Opinion of the Commission of Governance and Constitutional Points of the Congress of the State of Guanajuato, it was established the relevance of this transformation and that the University:

*It has proven to be a mature institution with stability in its governing regime. Since its origin it has evidenced its capacity for evolution [...] during these thirteen years of validity [it refers to the Organic Law in force since 1994, when university autonomy was recognized]. However, the university community considers it pertinent to enter a reform process that allows greater dynamism and responds to the current requirements of higher education. That is why the proposed law reflects new academic modalities, Campuses, Divisions and Departments for higher education (University of Guanajuato – UG, 2008, p. 16).*

To understand this reform, it is important to consider that: "Organizational change consists of the set of transformations that are carried out in the different dimensions of organizations, it is produced both by natural forces and driven by the will of those who create and drive them." It is a *planned change*, which can be seen from "the perspective of organizational development, which seeks to promote the improvement of the organization in parallel and contingently with the development of people." And this planned change, constitutes an "intentional transformation, of great magnitude and scope, of the organization, in order to improve its current performance and to project itself into the future" (Acosta, 2002, p. 22).

Although, obviously, this was the intention of the change, in these years, the university community has had moments of hope, uncertainty, frustration, anger, claim, acceptance, adaptation ... in a learning phase not always shared, but immanent to everyday life. We review, then, how this change has been experienced, the costs and value of it, as well as some circumstances, which, from the theoretical and experiential foundation, can result in a more venturesome stage for university academic development.

### **Environments of change. From "Glory and Honor" to Self-Criticism at the University of Guanajuato**

The passing of the years has given us answers about the change at the University of Guanajuato. Some members of the university community, we wondered, at the time of the initiative, why the change of structure was necessary, if the University enjoyed a prestige that the indicators showed: quality programs, suitable profile of the teaching staff, certified administrative procedures, favorable work climate, etc. A glory and an honor, that beyond the lyrics of the University Anthem, we all believed and enjoyed.

However, trends in external evaluation drove to be better and it was decided that the change of academic-administrative structure would be the next step. In addition, the goal of coverage was still pending (the University barely absorbed 3% of the demand) and indicated in the Institutional Development Plan (PlaDI 2002-2010), for which this radical transformation was imposed. That was the indisputable element to believe in the reform, to face the challenges that it would bring with it and to pay the costs that were necessary. The other indicator of the change in structure concerns the cultivation of sciences isolated from each other, in the different academic fields, before which the proposed solution arose from the formation of the Divisions; that is, the great academic challenge of this change was interdiscipline first, and transdiscipline later. In this sense, on the one hand, it is explicit that the Organic Law:

*It must contribute substantially to increasing, with quality, equity and relevance, the number of spaces [...] in such a way that the opportunity for young people to access higher education is strengthened by the permanent action of the University of Guanajuato, in all regions of the State (UG, 2008, p. 13).*

On the other hand, it was emphasized the great importance of the integral formation of the students, and in how the academic-administrative reformation would allow "that the students have more opportunities for an interdisciplinary formation [...] that] will temper their character, develop their skills and equip them with the tools that allow them to be more open, understanding, tolerant, respectful and socially productive entities" (UG, 2008, p. 14).

Based on theoretical references, organizational change implies, on the one hand, a response to external changes and, on the other, an internal rearrangement (Acosta, 2002). And, from the general theory of systems, every organization is considered as an open system that, therefore, interacts with the external environment and, at the same time, impacts on the internal areas and units of the organism in question. In the same way it works in educational institutions, and, in the case of the University of Guanajuato, it is evident (although it is not shouted) that the change responded, to a large extent, to external pressures, above all, from evaluation bodies that guided the existence of a matrix structure that, at least in theory, is more transversal and contributes to interdisciplinarity.

It is common for transformation by pressure and not by conviction to be assumed as a trend and that, despite understanding the need for change, it is carried out without a deep analysis and without being able to foresee or ensure the results (Sandoval, 2014). In the case of the UG, although it cannot be said that the change was not thought of, it was probably impossible to conceive how the actors were going to react, how much resistance they were going to put in, or prevent the bureaucratization of administrative procedures.

As Acosta (2002) put it: "organizational change occurs in the entire organization or in its structures, in processes, areas or dimensions (politics, internal functioning, external relations, etc.)" (p. 10). However, it depends on the emphasis that is placed, either on the formal organizational structure, properly, on the organizational culture, human behavior or, in procedural, technological or infrastructure aspects.

From this perspective, the transformation at the University of Guanajuato focused on the organizational structure, although, obviously, issues related to people, their functions (within the framework of structural change) and their interactions were also addressed; in addition to aspects related to institutional philosophy, such as the Mission, aims and university values.

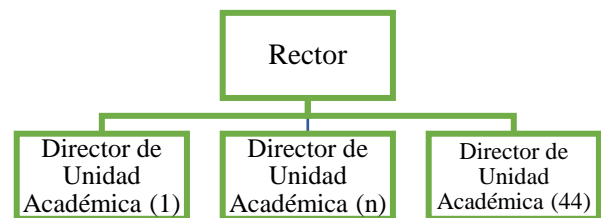
"Glory and honor to the old reliquary..." Could it still sound after these years of having undertaken the reform? Some data of what we experienced, which we present below, can indicate the meaning of the phrase.

## Results

### Change and tensions: from theory to practice and everyday experiences

The Organic Law of the University, approved in October 2007, by the LX Legislature of the Congress of the State of Guanajuato, marked the greatest milestone in its history since 1945. Thus, the Institution, with its schools and faculties, lived its last months as such, in a transition towards the departmental-matrix-multicampus model.

A description of the structure of the University of Guanajuato up to that date was simple. As for the government exercised by the one-person authorities (we will focus on them, for practical purposes, without ignoring that the collegiate bodies are the highest governing structures), it was reduced to a Rector and the Directors of the various academic entities (Institutes, Faculties, Schools and Centers). The authority, responsibility and decision of university life was concentrated in these two figures (see Figure 2). In the current model, the governance of the University consists of a Rector General, Campus Rectors, Division Directors and Department Directors, who respond to this structure.



**Figure 2** Outline of the one-person authorities in the previous structure

Source: Own elaboration based on the Napoleonic structure

The first concrete derivation of the Organic Law was the appointment of the single-person authorities in 2008: the Rector General, 4 Campus Rectors, 13 Division Directors and 49 Department Directors, were appointed in staggered and consecutive processes. The university community lived and continued, almost normally, in the daily life of its chairs and other activities. A conviction and confidence that something good would come was breathed in the environment, in a context of expectation and interest.



At the end of 2008, the collegiate governing bodies were erected: General University Council (highest authority), University Campus Councils and Divisional Councils. With these figures, the structural change and the scenario were ready for the implementation of the matrix-departmental-multicampus model. The academic structure was established. Where did the administrative structure forget, who would be the people in charge of communicating, animating, and supervising the new organizational model? The theoretical analysis shows us that it was omitted to detect the "agents of change [...] who are in charge of the task of implementing the necessary changes for organizational development [...] It is up to them to convince, stimulate and coordinate and manage all the human and material resources that lead to the desired objective." (Garbanzo-Vargas, 2016, p. 74). Undoubtedly, the results of this process would have been different – perhaps with more certainty – if we had selected these agents, capable of collaborating in the transition from one university to another.

In addition to this selection of agents, as Zimmermann has put it, it was necessary:

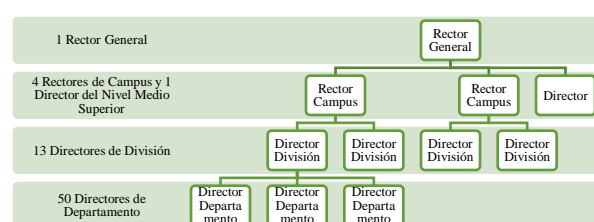
*To capture [this] change thoroughly as an organizational learning process that aspires to change both attitudes and values of individuals, as well as organizational processes and structures. The axis of rotation consists of a communication work, cautious and sometimes slow, to prepare the opening and the entrance towards a possible planned change, so that the organization becomes "smarter" (2000, p.74).*

As stated above, at dawn 2009 the "new" University was outlined, with two subsystems: Higher Level and Upper Middle Level (Article 11 of the *Organic Law of the University of Guanajuato* – LOUG).

a) A College of the Upper Middle Level, now composed of 11 schools. (It is worth clarifying that this subsystem practically preserved the previous structure, with its government figures at the campus level: its academy, its director and its academic and administrative secretaries. The essential change is the introduction of a Director of the College of the Upper Middle Level, equivalent to the Campus Rectors in the Subsystem of Higher Level).

b) Four *campii* for the upper level: Celaya-Salvatierra, Guanajuato, Irapuato-Salamanca, and León. The "Campuses" (it was decided to use the term for both the singular and the plural), are academic-administrative entities geographically located in the development poles of the State, waiting for each one to meet the very specific educational needs of the region. The Guanajuato Campus, as is to be expected, is the most complete and complex of the four since it inherits the core of the origin of the University itself. He only gathered, in round numbers, 50% of the entire institution: enrollment, professors and new dependencies.

c) Thirteen Divisions and 50 Departments. In accordance with the provisions of article 13 of the LOUG, the Divisions are integrated into the Campuses, and "are constituted by Departments due to their similarity or disciplinary affinity or object of study. Educational programs and students are attached to them." The Departments, on the other hand, "are the basic academic entities for the realization of the essential functions of the University. They will be made up of integrated professors based on the affinity of disciplinary or thematic interests." Figure 3 shows, broadly speaking, the not so new academic structure of the University of Guanajuato, considering only the single-person authorities.



**Figure 3** Outline of the single-person authorities in the current academic-administrative structure of the University of Guanajuato

Source: Own elaboration based on the unipersonal authorities within the matrix-departmental-multicampus structure

It is striking that, in theory the matrix model is more horizontal and favors "greater decentralization and deconcentration of decisions, both of collegiate bodies and of single-person authorities" (Current Regulations of the University of Guanajuato, 2008, p. 70), as well as the duty of the University to ensure "mechanisms and procedures for the linkage between its Campuses, Divisions and Departments (fourth paragraph of article 13 of the LOUG).

However, in practice, there is a greater verticality, with more levels and less margin of action in the Departments, which constitute the basic nucleus for the development of essential functions and where there are no own resources and, in many cases, there is a dependency - and even subordination - to the Divisions, in particular, to the qualities as a leader and the leadership styles of executive authority at that level.

As for the university community, the expectations of the various sectors were different: the students barely knowing what was happening, the teaching staff waiting, the administrative staff with an appeased fear, the authorities in the construction of the profiles of functions. Despite this, again, all the actors showed patience and responsibility, held back the anxiety and continued their work as every day.

Raising a great work is not possible overnight. So, from October 2008 to January 2009, the university community was waiting for everything to be not only new, but better. This was not the case in the following ten years, in areas as specific as the lines of authority in the different headquarters and the bureaucratic-administrative procedures. On the contrary, from the beginning, there were perceptions that alerted, warned, remembered, that the much-desired matrix-departmental modality would not be simple. Maybe it would have been easier if it was not based on a previous structure, but it was not so: behind that change a whole tradition of doing things was maintained.

A calmer analysis has shown us that one of the traditions that has charged the most costs are the figures of the old authorities and, therefore, of the faculties and attributions of each one. The University of Guanajuato was a territory governed by a rector and 44 directors of academic units (schools, centers, faculties, and institutes); the rest of the management staff were "supportive". In this way, the professors identified as "bosses" only two: their director and the rector, and they were close presences. Similarly, students identified the academic secretary and the director of and in their academic unit; from those moments, in all cases, the authorities are more and in some cases they are remote. Administrative procedures are slower, no responsibility is identified for various daily matters, etc.

Simply put, we have spent years with the perception that we were better off before, and that the new structure has hurt many and many. The theory accounts for these facts, as a direct result of a resistance. Opposition to change is that it threatens the needs of security, social interaction, status or self-esteem. (Chirinos, s/f). In this regard, it has been hypothesized that:

*Even if the directives have sufficient power to implement the changes, there will be forces that will put up a level of resistance directly proportional to the power of influence they have over the internal groups. From another point of view, the speed of change is determined by a law of inertia, that is: if the organization is in a natural process of change, then it will change rapidly while if it is going through a moment of stability and equilibrium, it will tend to oppose with greater resistance to change and therefore the speed of change will be lower" (Acosta, 2002, p.23).*

Zimmermann confirms this assertion when saying: "When we want to bring about a thorough change in an organization, the time needed is perhaps the most important factor for success" (2000, p. 74). He explains that we often forget that organizations have a certain ambivalence between the productive and social aspect: because the modification of internal rules, the division of labor, the assignment of functions, procedures, technology, etc., "simultaneously change people in organizations and interpersonal relationships" (p.75). He adds: "An organizational change directly affects the biographical and emotional roots and professional career of the people involved, their individual identity and their social position" (p. 73).

In this same sense, Chirinos in quote from Gallardo (1996), points out that, in the resistance to change, the emotional aspect is expressed with all clarity, as, in fact, we have witnessed, going from the stage of Denial (anxiety), Defense (apathy and anger and incipient analysis of the situation), Acceptance (impotence, gestation of possible solutions) and Adaptation or assimilation (satisfaction). As in any human experience, there is a multiplicity of nuances, but the evidence allows us to affirm that, in general, the university community has already gone through these phases, in search of consolidation.



### Between change and tradition: gaps and learning

More than ten years after the change of academic-administrative structure, progress has been made in the understanding of these transformations and in the development of the activities inherent to each of the levels within the organization. However, the tradition in the development of some processes still weighs heavily and, therefore, gaps remain in terms of the complete application of the complex organizational changes that were introduced at the University.

One of the problems that persists is derived from the doubling of the structures and single-person authorities, the "windows" increased and, therefore, the bureaucracy... The procedures are slower and, sometimes, involve long transfers, due to the remoteness of some venues. However, it must be recognized that the authorities have tried to expedite them and to comply with the provisions of article 6 of the Organic Law of the University of Guanajuato, which makes it clear that it is up to it: "To develop its academic and administrative organization, observing the principle that administrative activities are subject to those of an academic nature" (section II).

Another situation that has not been eliminated is related to the faculties and scope in the management of the directors of the Department who, despite being the academic leaders and those in charge of conducting the development of the essential functions of the University, do not have the resources for it, and depend on the distribution that is made in the Divisions to which they are assigned. An interpretation of the process experienced around the change of organizational model at the University of Guanajuato, is facilitated by the theory of organizational learning, postulated by authors such as Senge (1992), Argyris and Schön (1996), Leithwood and Louis (1998) Bolívar (1999, 2000a), cited in Chirinos, s/f. An organizational learning conceived by some authors as:

*Process and result, is the process by which people and groups within the organization develop new competencies, and in terms of the result, it would be "learned" knowledge, the demonstrated competencies of the members, which, applied at work, allow them to achieve efficacy (Cervantes, 2021, p. 2).*

In this learning journey, we can appreciate two aspects that explain such a theory: one of them refers to the nature of learning and the other to the subjects who learn. As for the nature of learning, generative and second-order learning is defined as the type of learning of the organization. In relation to the subjects, Organizational Learning supposes the existence of learning at three levels: individual, group and organizational (Romero, 2003, p. 6). Here we allow ourselves to suggest the paths to follow by the different instances once the lessons have been achieved.

The critical mass of the University of Guanajuato, made up of faculty and students, is a patient and understanding community, but, above all, responsible and committed. After odd episodes, at this time, initiatives must emerge from the official leadership, but also from the academics.

It is in the Departments where academic life takes place; made up of full-time professors organized in Academic Bodies or research groups; part-time teachers, who mainly attend to teaching. The forms of collegiate life must arise from the professors themselves, whose essence of their work is identified with the consolidation or promotion of research and teaching, their link with networks of national or international colleagues, etc. In these dependencies is where the following projects or initiatives can and should be forged:

- a) The research nucleated in the academic bodies, in connection with projects of other academic bodies of the Division, the Campus and the University.
- b) The consolidation of educational programs (careers, degrees) through quality teaching of specialists in these areas of knowledge, enriched by the participation of teachers from other disciplinary areas.
- c) The curricular development of educational programs as a product of collegiate work, led by the Department Directors and by the Heads of the Academic Bodies.

On the other hand, from the Divisions (to which the educational programs and the students are assigned) it corresponds to lead the following tasks, also tending to achieve the interdiscipline-transdiscipline:

- a) Priority attention to the integral formation of the student, as the center of the Educational Model of the University of Guanajuato (another normative change that was conceived in 2011).
- b) Interdisciplinary research according to the lines cultivated in that area. The Division must then promote the consolidation of its scientific work and even propose the lines of development of transdisciplinary research through coexistence with other Divisions.
- c) The teaching enriched by the professors of all the Departments, from the subjects or common subjects of that Division.
- d) The curricular flexibility that fosters, effectively, a more complete training that goes from monodiscipline to interdiscipline and transdiscipline.

As for the Campuses, from there must start the strategies that meet the development of the disciplines in line with the needs and social requirements of the geographical regions they cover. Among others, the Campuses are responsible for the following tasks:

- a) The design of a master plan to regulate the mobility of teachers and students, privileging the exchange between disciplines, through the issuance and monitoring of strategies for the review, updating, modification and creation of new educational programs with a high sense of social relevance.
- b) The design and implementation of alternative forms of education that optimize the academic and physical infrastructure of the Campuses, which lower the geographical limitations for dialogue between disciplines, teachers, and students.
- c) The constant, permanent and pertinent updating of the professors, through an institutional program, promoting a new work environment that is reflected in the participation and collaboration of the entire university community.

And, in the end, from the General Rectory, we must wait for the institutional policies that govern the entire University. Among other tasks, we write down the following:

- a) The expansion of the coverage and educational offer of the Institution, with quality, equity and relevance
- b) The concretion of the educational model that has students as its center, but that must start from a *new teacher*.
- c) The application of academic models or curricular structure that promotes interrelation through the educational programs of the various disciplines cultivated at the University.
- d) The promotion and strengthening of internationalization, above all, with prestigious institutions abroad.

Finally, it is essential to recognize that, in these processes of constant learning around organizational changes, the most important thing is to focus on people, who are the ones who think, gestate, and develop these changes.

In this sense, we must bear in mind what was raised by Stephen Covey (1995), who proposed as a necessity, precisely, that we consider the people in the organization as we want them to treat the other people with whom they interact. And, we add one of his most famous phrases:

*You can buy a person's work, but you cannot buy your heart or your mind. At the heart are their loyalty and enthusiasm and in his mind, his creativity, his ingenuity, and his intellectual resources.*

Stephen Covey

### **By way of conclusions: a transition to hope**

Beyond the wear and tear and perceptions of the university community, of the real and figurative difficulties, the academic-administrative structure of the University of Guanajuato tries to respond to the demands of a world submerged in uncertainty, in complexity, in the demand for a new profile of students and graduates. In this way, and after having spent the last few years working steadily to reach the concretion of the matrix-departmental-multicampus model, perhaps we are witnessing the gateway to academic work where dialogue, interrelation and collaboration take place.

The invitation to advance begins with department heads, as academic leaders, focused on academic and non-administrative management. Next, the call is for the Divisions, since the educational programs are assigned to them (the administrative part, but also the heading for their academic development), until involving the Campus Rectories, where the strategies for the most socially relevant educational development reside; and, of course, all in response to the leadership of the Rectory General.

From 2015 we began to glimpse a small thread of light towards hope: the one-person authorities already have enough learning to consolidate the structure and clean up the work environment; we trust that the professors have overcome amazement, surprise and even disappointment to work collegially within and outside the walls of the Departments, supported and promoted by the Divisions. And, without a doubt, it will continue to be the students who continue to show us that coexistence and transfers between the various disciplinary positions are possible and let us learn from their flexibility and their confidence in a future that always impels forward.

They have been years of learning, of experiences that can be shared, of reflections that have taught us that we were neither so mature nor so finished, of applying tolerance and humility as authorities, collaborators, and subordinates. We are now on the threshold of a total renewal of the authorities that began in the last five years: welcome the air of hope, of continuing to trust, of waiting for the University to walk through the reality of humanism, respecting the dignity of each person, beyond taking care of the standards and indicators required by external evaluation. The costly learning acquired must now bear fruit.

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## Vocational Decision Making and Anxiety during the Coronavirus 19 Pandemic

### Toma de decisión vocacional y ansiedad durante la pandemia de coronavirus 19

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#### Abstract

Vocational decision making and anxiety during the coronavirus pandemic. The objective of this research is to identify the relationship between vocational decision making and anxiety during the coronavirus pandemic. The study is descriptive, cross-sectional, non-experimental, correlational. The study subjects are high school students who are at the time of making a vocational decision. The students were selected using the snowball technique since they were not in the classrooms of educational institutions during the semester period from January to July 2021. The variables of the study are vocational decision-making and anxiety in times of coronavirus pandemic. The reliability of the evaluation instruments such as the Herrera and Montes Interests and Aptitudes Questionnaire and the Beck anxiety test were obtained. Locating the correlation between the variables. The SPSS statistical package was used for data analysis. The obtained results, in terms of the reliability of the instruments that place them on a Cronbach's Alpha, are between .8 and .9 each of them. The main conclusion is that the relationship between anxiety and vocational decision is not important for vocational decision making since anxiety during the coronavirus pandemic does not affect vocational decision.

**Vocational decision making, Anxiety, Coronavirus pandemic**

#### Resumen

El Objetivo de la presente investigación es identificar la relación entre la toma de decisión vocacional y la ansiedad ante la pandemia del coronavirus. El estudio es de tipo descriptivo, transversal, no experimental, correlacional. Los sujetos de estudio son alumnos de nivel medio superior que están en el momento de tomar una decisión vocacional. Los alumnos fueron seleccionados por medio de la técnica bola de nieve ya que no se encontraban en las aulas de las instituciones educativas durante el periodo del semestre de enero a julio de 2021. Las variables del estudio son la toma de decisión vocacional y la ansiedad en tiempos de pandemia del coronavirus. Se obtuvo la confiabilidad de los instrumentos de evaluación como es el Cuestionario de Intereses y Aptitudes de Herrera y Montes y la prueba de ansiedad de Beck. Ubicando la correlación entre las variables. Se utilizó el paquete estadístico SPSS para el análisis de los datos. Los resultados obtenidos, en cuanto a la confiabilidad de los instrumentos que los sitúan en un Alpha de Cronbach, están entre .8 y .9 cada uno de ellos. La conclusión principal es que la relación entre ansiedad y decisión vocacional no es importante para la toma de decisión vocacional ya que la ansiedad durante la pandemia del coronavirus 19 no afecta la decisión vocacional.

**Toma de decisión vocacional, Ansiedad, Pandemia de coronavirus**

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## Introduction

Addressing the issue of vocational decision-making and anxiety during the coronavirus 19 pandemic is important. Students from educational institutions within their evolutionary development present crises in various stages, one of those crises occurs in a period where they must choose professional career, a crisis that can be aggravated by the presence of the coronavirus 19 pandemic in the face of policies for its containment. Identifying the relationship that occurs in decision-making and the impact of anxiety will offer possibilities to develop coping strategies for students and that, in the face of this risk situation and other similar ones, they have established ways to reduce the harmful effects of the pandemic in a vocational decision.

The central hypothesis of this research is that anxiety coming from the coronavirus 19 pandemic influences the vocational decision of upper secondary school students.

The development of this work is carried out in three theoretical sections where the issue of vocational decision will be addressed, later the anxiety in the vocational choice and finally the vocational decision and the coronavirus 19 pandemic, The methodology, presentation of results and conclusions.

## The vocational decision

Within the evolutionary development, people face different situations that lead them to take decisions. Among these decisions are those of a vocational nature. They are important because they involve psychological processes that involve life projects; therefore, they are fundamental in the construction of the student's future, mainly of those who are in the stage of deciding the direction of their career that will lead them to a profession that will allow them to adjust to the world of work with their personal characteristics.

The decision is defined as a "voluntary act, choice that follows conscious and reflective deliberation" Dictionary of Educational Sciences (1996). This voluntary, conscious, and deliberative deliberation must lead to a decision making. Decision making "is a special type of problem solving in which we already know all the possible solutions or options.

The task is not to find new solutions, but rather to identify the best available solution, or the option that is closest to meeting our needs and goals." Morris and Maisto (2011).

The vocational decision in adolescents is one of the actions that presents a great tension since it shows little certainty of the different factors that must be taken into account to arrive at the vocational choice that allows them to pursue a career. Rivas (1998) understands career as the "sequence of positions held by a specific person through their pre-professional, professional and post-professional life". Thus, the development of vocational behavior that already comes from the family is taken from the context of the educational system. Vocational behavior occurs in "a dialectical relationship between the person and the socio-professional environment that signals the culmination of the evolutionary process of socialization of the human being in their productive environment" Rivas (1998).

The vocational process begins from the socialization in the family through the school as one of the institutions that will be in charge of bringing the training that will culminate in the integration of its graduates into the productive labor system in accordance with the requirements of the world of work. The most satisfactory way to carry out the vocational decision-making process is the adaptation of the individual's personal characteristics to the characteristics of the world of work.

Getting to choose a profession contains the execution of psychological processes that will allow involvement in work environments. From a vocational developmental perspective, the adolescent goes through various periods in vocational behavior that depend on spatial-temporal situations that go from childhood, through play, to the formalization of professional activity in adulthood. According to Ginzberg in Rivas (1998) there are three periods: 1. Fantastic period that goes from birth to 11 or 12 years. 2. The tentative period ranging from 11 to 17 years old. 3. Realistic period that goes from the 18 years to the twenties (approximately between the 24 to 25 years). The period in which the adolescent must make vocational decisions and presents a critical stage due to the adolescent's development conditions is the trial period, where the adolescent is located within the upper middle level in the school system and in a situation of vocational choice.

To make this choice, the adolescent's personal factors are combined, such as their vocation expressed in their interests, their aptitudes, the personal identity that is achieved through the adaptation of the various social roles and the occupational identity. Regarding the intervening social factors, as the genetic load of parents heritage, heritage is involved, the relationships at home, family values, the perception of professions, the culture and the environmental context, the economic situation. All the above factors will take the adolescent to a vocational choice.

### **Vocational choice anxiety**

Finding a vocational decision is not an automatic and easy process to obtain, perhaps some adolescents do not go through a critical situation for making vocational decisions and they go without any problem until they enter the world of work. For Bohoslavsky (1974), psychoprophylaxis is "any activity that, from a level of psychological analysis and through the use of psychological resources and techniques, tends to promote the development of the human being's possibilities, the maturity as an individual and, ultimately, his happiness". It is about promoting the prevention of health in general and not only the mental health. In this prevention, "the participation of the psychologist in the face of problems that create anxiety in specific moments or periods of life: sexuality, professional orientation, job choice, etc." is found.

The factors that intervene in the vocational decision in general can be divided into two main areas, the sociological-based approaches and the individual-based ones, according to Rivas (1998) mentions the characteristics of each one. Sociologically based ones have to do with home, community, environmental pressures, socio-professional status, information and knowledge of professional roles, and rapid technological and social changes. In the individual factors, vocational behavior is directed to self-realization. It is a gradual and accumulative process organized in experiences, it leads to autonomy and personal commitment, it is multipotential in the vocation. The key to making the most successful vocational decision for students is to combine self-knowledge, the social factors involved, and knowledge of the world of work to which they will be incorporated.

Anxiety is present in this critical decision-making stage. When the person is able to overcome that anxiety with his own resources, he will carry out a process that will allow to prevent negative repercussions on the student's general health, both psychologically and physically. But in the event that anxiety blocks the ability to make that vocational decision, it will be necessary to go to vocational counseling, where it will be identified and deepened through a vocational counseling process aimed at obtaining a vocational decision.

Anxiety can be defined as an anticipatory response to future harm or misfortune, accompanied by a feeling of unpleasant dysphoria, somatic symptoms of tension or avoidance behaviors (Ministry of Health and Consumer Affairs, 2008). Anxiety can present various signs and symptoms which can be a feeling of nervousness, agitation or tension, a feeling of imminent danger, panic or catastrophe, increased heart rate, rapid breathing, sweating, tremors, feeling weak or tired, trouble concentrating or to think about something other than the current concern, having trouble falling asleep, suffering from gastrointestinal problems, having difficulty controlling worries, having the need to avoid situations that generate anxiety.

### **The vocational decision and coronavirus pandemic 19**

One of the external factors that have strongly impacted the development and course of social interrelations in the global context has been the pandemic due to covid 19. The data obtained from the United Nations (UN) until October 25, 2021, are the next. In the world: 242 688 319 confirmed cases 4 932 928 deaths and 6 655 399 359 doses of vaccine applied. In Mexico: 3 783 327 total cases, 286 346 deaths and 115 185 985 doses of applied vaccines reported (UN Mexico, 2021).

Educational institutions have not been the exception, on the contrary, the restrictions carried out by the authorities of all levels of government to combat the pandemic began in the area of education and were among the last institutions that took action to move to the normal. Schools, despite the difficulties that have arisen, have carried out their work virtually with digital technologies offered by current technological advances.

According to the research by Paredes and Gómez (2020) in which they deal with anxiety and depression in university students during the pandemic, in their conclusions 66.7% responded that from time to time they feel tense or nervous, which indicates the existence of anxiety in students.

The activities related to vocational guidance from educational institutions have continued to be implemented by adapting to social, health, educational conditions, and the vocational counseling itself. Higher-level educational institutions have followed their selection and acceptance processes for their new members through the educational offer available at times of vocational decision and selection of professional career options. Actions have been implemented so that the students of upper secondary education who are in the stage make a vocational decision.

There have been offered various activities such as the ExpoOrienta, which is an academic event that brings together various public and private educational institutions. They show their educational offerings. Upper secondary level students have the opportunity to know, understand, analyze and compare the different options that will allow them to decide their life project in the professional field. There are other options so that students can get to know themselves by also offering them tools that help to achieve that self-knowledge.

In this way, the student is offered a possibility of knowing himself as their interests, aptitudes, abilities, motivations, personal potentialities and likewise the knowledge of the professions and the world of work to which they will enter in the future through of an adjustment of the personal and social aspects with the characteristics of the labor world to which they must enter.

Even with all this set of elements that are offered, the student may experience symptoms of anxiety and at a given moment a blockage may appear in the ability to choose a vocational option or to overcome that anxiety and reach a vocational decision.

## Methodology

The research is quantitative, not experimental, descriptive. It was carried out with students belonging to various educational institutions in the State of Zacatecas. A total of 66 students participated. The selection of the students was by the snowball technique since they were not in face-to-face classes and the instruments were applied in person. The general objective of the research is to identify the trend in the vocational decision and the anxiety level of the upper secondary level students.

The hypothesis is that anxiety in times of the Covid 19 pandemic influences a trend in the vocational decision of high school students. To identify the trend in the vocational decision, the Herrera and Montes questionnaire on interests and aptitudes was used. It has 60 questions for interest and 60 questions for aptitudes.

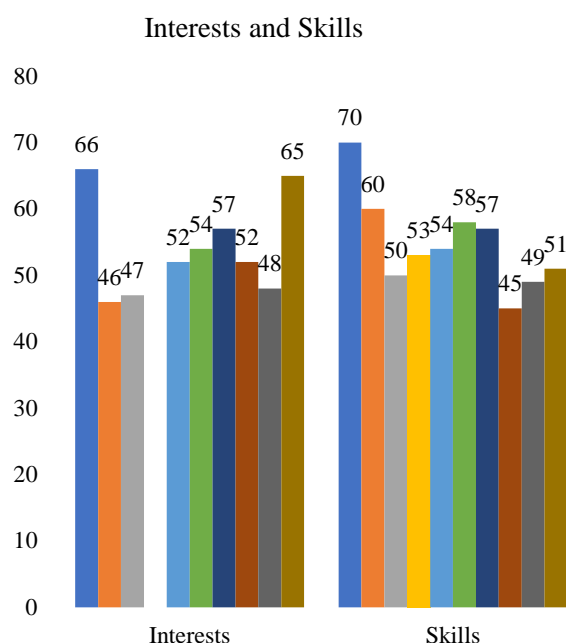
With a Likert-type scale, the options were: a lot, pretty much, indifferent, a little and nothing. With a value of 4, 3, 2, 1 and 0 points respectively. It has 10 areas: 1) Social Service (SS), 2) Persuasive Executive (EP), 3) Verbal (V), 4) Plastic Artistic (AP), 5) Musical Artistic (AM), 6) Organizational (ORG), 7) Scientific (CT), 8) Calculus (CI), 9) Mechanical (MC), and 10) Outdoors (AL).

Scores were obtained according to the scales established in the questionnaire. The Beck II Anxiety questionnaire consists of 21 items with a Likert-type scale, the options being 4 statements that are scored 0, 1, 2 and 3 according to the option selected. The obtained result is the level of anxiety that can be low, medium and high.

## Results

The results are presented by means of comparative graphs and tables that were obtained through the applied tests. Regarding interests and aptitudes

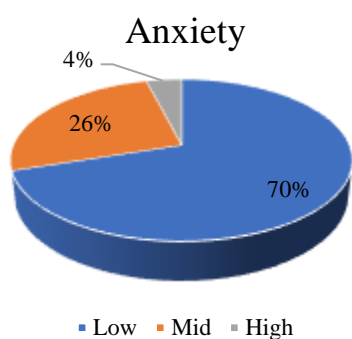




**Graph 1** Interests and Skills. The percentage is shown in each area

Area	Interests Centile	Skills Centile
Social Service	66	70
Persuasive Executive	46	60
Verbal	47	50
Artistic Plastic	57	53
Artistic musical	52	54
Organizational	54	58
Scientist	57	57
Calculus	52	45
Mechanical	48	49
Outdoors	65	51

**Table 1** Comparative in percentages of vocational areas



**Graph 2** Anxiety levels presented by the students of the upper secondary level

Regarding the reliability of the tests applied through Cronbach's Alpha coefficient, the following table is presented:

Test	Cronbach's Alpha
Anxiety	.86
Interests	.92
Skills	.91

**Table 2** Reliability of the instruments used in the research

## Conclusions

The used instruments have a reliability located in excellent since they have a score between .86 and .92. The area of vocational trends with the highest choice was that of social service, both in interests and aptitudes with a percentage of 66 and 70 respectively. The second area in interests was outdoors with a percentage of 65 and the persuasive executive area in skills with a percentage of 60.

Regarding anxiety, they were placed as follows: Low 70 percent, medium 26 percent and high with four percent. According to these results, the hypothesis is rejected since the high school students who have to make their vocational decision do not present significantly high levels of anxiety during the Covid 19 pandemic.

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**COVID-19 pandemic: Virtual technology applied to higher education at CU UAEM Valle de México and Ecatepec****COVID-19 pandemia: Tecnología virtual aplicada a la educación superior en los Centros Universitarios UAEM Valle de México y Ecatepec**

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**Abstract**

One of the most important challenges in the education system are the technological advances in the educational models at a higher education, achieving a transformation of the student's thinking, in an approach of analysis and innovative construction based on interdisciplinary processes and creativity. The Autonomous University of the State of Mexico is aware that its teachers must have a comprehensive training in communication and creativity with a social and humanistic commitment with transcendence of technological research. Due to COVID-19, pandemic caused by an infectious virus that produced a total closure of educational facilities, in which the only teaching alternative is online, this technology has been integrated by necessity to the educational system with a different pedagogical approach, which has been questioned by the type of knowledge acquired by students. Finally, this research awareness among the teachers of Valle de México and Ecatepec that they must face the challenges in the use of virtual technology.

**Resumen**

Uno de los retos más importantes en el sistema educativo es el conjunto de los avances tecnológicos en los modelos educativos a nivel superior, logrando favorecer una transformación del pensamiento del estudiante, en un enfoque de análisis y de construcción innovadora fundamentando procesos interdisciplinarios y de creatividad. En este sentido, Universidad del Estado de México (UAEM), es consciente de que sus Docentes deben tener una formación integral en la comunicación y en la creatividad con un compromiso social y humanístico con trascendencia de investigación tecnológica. Debido al COVID-19, pandemia causada por un virus infeccioso que produjo un cierre total de instalaciones educativas, en el que la única alternativa de enseñanza es a través de sistemas digitales, de este modo la tecnología se ha integrado por necesidad al sector educativo con un enfoque pedagógico diferente, del cual ha sido cuestionado por el tipo de conocimiento adquirido por los estudiantes. Finalmente, el sentido de esta investigación es concientizar a los docentes de dos centros universitarios de la UAEM Valle de México y Ecatepec que deben afrontar los desafíos en el uso de la tecnología virtual en el aula de clases.

**Virtual Technology, Creativity and Education****Tecnología virtual, Creatividad y Educación**

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## Introduction

Severe restrictions on the movement of people and rules on physical distancing have now been established, determining social isolation due to the rapid spread of the disease caused by a new coronavirus (COVID-19) case that came from Wuhan, Hubei Province of China. That since 11 March was declared a pandemic by the WHO (World Health Organization) (A Urresti & Marcellesi, 2012), as a prevention measure for the spread of this infectious virus, the Government of Mexico establishes a strict recession of face-to-face educational activities with the slogan STAY SAFE at HOME. In this sense, the digital technology based on-line is the only alternative to still providing the essential public service, such as education among others.

An example of these solutions is the SEP organization (Secretary of Public Education) implemented a teaching & learning program (HOME LEARNING) that consists of offering virtual classes on television for students enrolled in preschool, first level on basic education and high school, so, Bachelor's students can continue their education according to the SEP scholar - schedule. However, other higher-level students take advantage of digital tools, Apps, E-mail, WhatsApp, Digital books, Mobile devices, Internet connection, Online education programs and educational platforms to maintain communication with their teachers and attend their virtual classes.

Thus, today digital technologies have been considered an essential for higher education students, therefore the present research focuses on two University Centers belonging to UAEM, the Valle de México and Ecatepec, which require a qualitative study that evaluated and identified the use of creativity that teachers and students commonly employ in virtual environments through new generation mobile devices. This will allow the teachers to know and search for the different capabilities of a virtual class using digital technology with respect to a traditional classroom, thus creating a transformation strategy in competencies and skills, whether group and individual to solve any professional or academic problem inside and outside the classroom.

Therefore, it is important to deduce that the teacher must corroborate, enrich, and approach the teaching practice in a mediating way with skills of cooperation, integration and empathy with students using creativity and innovation in the classroom all the time. In this way, it is assumed that the teacher's job is to seek an innovative approach to the design of his teaching with the support of students who use digital technology to integrate the contents in virtual environments or support materials that help reflection and practical and theoretical analysis with different teaching and learning strategies, that comprehensively supports the evaluation of the knowledge acquired by students of higher education.

## Methods and description

This qualitative research is based on a method of data collection and analysis to obtain information from students and teachers in order to quantify the research problem if creativity is the result of innovative strategies applied to the teaching-learning process, which has caused the globalization of learning in an immediate sequence of transformation of competencies and skills of students and teachers.

The sample population of data considered in this study is around 546 students of higher-level education distributed in different semesters of two University Centers belonging to the Autonomous University of the State of Mexico UAEM, as shown in Table 1, CU of Valle de México and CU of Ecatepec.

University Center	Profesional career	quantity
Valle de México	Accounting	85
	Administrative informatics	50
	Administration	157
Total		292
Ecatepec	Accounting	124
	Administrative informatics	129
	Administration	1
Total		254
Total		546

**Table 1** Sample size of data collected from two UAEM University Centers

*Source of Reference: Own Elaboration*

As indicated in Table 1, the groups were randomly chosen for each University Center in the period 2021-A (February to July), so the UAEM Valle de México University Center has 53.2% of surveys answered and 46.8% corresponds to the UAEM Ecatepec University Center.

Six variables will be studied that will help identify the behavior of the teacher in the virtual classroom in the use of creativity and technology, allowing the improvement of the teacher in a cooperative, constructivist learning, mediator of the teaching-learning process, as well as the professional competences of the teacher. Students and teachers will have developed the following skills and competencies:

1. **Creativity and innovation**, using mobile devices in virtual environments.
2. **Communication and collaboration**, use of virtual environments that allow ideal communication and information such as videoconferencing to interact with other students online, work collaboratively, include online work to support individual and collective learning, as well as having the link of students with other cultures.
3. **Research and information management**, this implies the use of technological tools that allow the student to collect, select, analyze, evaluate, or use the information that the teacher is requesting in the classroom, as well as process the data and communicate the results of an investigation.
4. **Critical thinking**, problem solving and decision making, students were required to develop critical thinking skills to plan, organize and solve problems and decision-making of work and professional life using mobile devices.
5. **Digital citizenship**, this one refers to the student understanding the human, cultural and social issues related to mobile device technologies and the application of ethical, legal, safe, and responsible conduct of use.
6. **Operation and concepts of mobile device technologies**, involves the understanding of concepts related to environments, systems, and operation to select and use productively, as well as transmit knowledge of learning new technologies to apply them in professional and working life.

## Results

The methodology is to develop the skills and attitudes to generate new scenarios with thoughts of reflection, practical and theoretical and innovative and creative, in the use of technology in the classroom that allow to break the rigid paradigm of the teacher providing in a simple way different way of seeing the situations within the teaching-learning process without losing the knowledge that you want to teach.

The author Gilda Walsburd (2009) reflects that commitment is the path of transformation and this path begins when the person is aware of his negativity and how this can be transformed into a creative energy; that is why the teacher must change paradigms and reengineer himself to strengthen in a positive way, creative and constructivist the way to give their class in the classroom, looking for the balance and mental health of the teacher and the student so that the process is easy and worth the search for technological tools to make innovative and creative changes inside and outside the classroom. In this sense, Figure 1 indicates a new reengineering of the teacher to develop innovative didactic strategies with commitment to a new creative and innovative scenario.



**Figure 1** Breaking paradigms

Source of Reference: Own Elaboration

Creativity is important in everyone who can emerge and express or develop when he is in a balance between cognitive-intellectual growth and effective-emotional growth since currently the teacher has implemented strategies in a positive and constructive way in the classroom with the use of virtual environments and mobile devices.

The techniques or strategies are accompanied by a theoretical framework and experiences that interact with each other, to train self-taught professional students in industry and organization. As author Francisco Menchen Bellon says (2009), creativity is like electricity, it's always there, but it needs to connect and ignite and sometimes producing the powerful current takes time. However, creating does not mean doing from anything, but is using the material available and consuming it according to original schemes (Menchen Bellon, 2009).

It is said that innovation is a process of gradual transformation that is developing step by step, currently education has had innovative changes that allow to prepare the teacher-student in the teaching-learning process for continuous improvement.

That is why teaching learning using virtual environments and creativity will allow you to know how to learn, how to dedicate your time and effort to learn and facilitate your learning, this is becoming the property of the university of this XXI century. As can be seen in Table 2, the renewal and innovation of the university in a process of change is indicated.

Individually using TICs to use traditional methods. The teacher does not take advantage of the potential of TICs	Normal changes of virtual environments. but without pedagogical transformation, without changes of attitude or procedure.
Individual use of TICs to update training: renewal of the teaching role, the role of students, and the methodology. Teachers who innovate on their own.	New university culture: emphasis on the student, on learning concepts, procedures, and attitudes; also, in the acquisition of skills. Holistic teaching innovation by faculties or institutions.

**Table 2** Renewal and innovation in the university of the XXI century

Source of Reference: (Guillermo, 2016)

In this way a virtual teaching-learning environment (VLE) is a set of computers and telematic facilities for communication and information exchange in which teaching and learning processes are developed, the Valle de México and Ecatepec University Centers are in a process of change such as planning, development, the monitoring, and evaluation of training in a virtual environment.

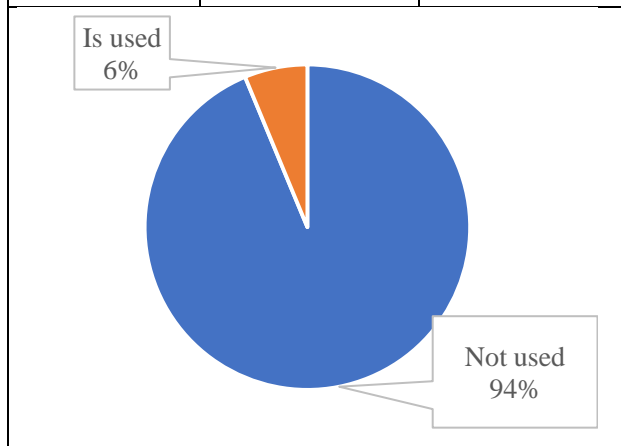
As a result of this research with students they have acquired skills and competencies to manage virtual environments, such as their own learning, being proactive, autonomous, fulfilling their own goals and above all the reflection of their own skills in a reflection of their reflective and critical learning, as well as a collaborative work in the classroom. The competent student must have the communicative skills, such as knowing how to write, know how to structure and know how to know to organize their ideas and correctly handle technology in their professional life.

It is important to mention that the Ecatepec University Center students supported the teachers in the development of virtual learning environments provided different tools that allowed the teacher to perform his function in the virtual classroom, which was a mediator, independent and integrative fulfilling the competencies and the objective of the learning unit. The teacher used tools such as: videos, forums, podcast, apps and carried out an agenda of activities that allowed the participation of the teacher and the student in a cooperative, practical way allowing to have real cases and put into practice the knowledge in a virtual environment.

Likewise, in the question the teacher and the student use in the virtual classrooms the mobile devices to teach their class and the students to develop the activities entrusted by the teacher. However, it was observed that 18.41% of students indicate that the teacher only teaches the class without using technological tools, so the teacher is not developing the skills and competencies necessary to solve any professional problem. It is important to indicate that creativity is an attitude of life, that teachers-students must commit to creating a transformation in the classroom with the use of virtual environments so that there is motivation and enthusiasm to have the right learning for each subject.

It was detected that students perform their jobs better and the willingness to carry out the activities in a collaborative and creative way has improved because they feel motivated in the use of technologies to express their knowledge. The result is the following question: Do you feel motivated to use digital tools in virtual environments to carry out academic activities? As can be seen in Table 5, students have developed the technological skills to implement them in their professional lives.

Answer	Answer number	Result in %
It is used	512	93.7%
Not used	34	6.2%

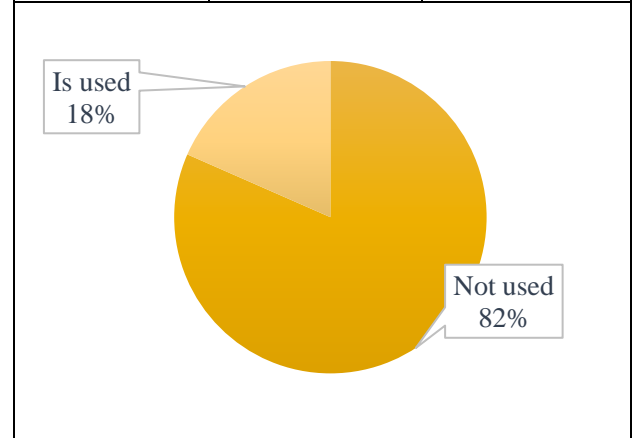


**Table 3** Percentage of the use of creativity of teachers and students in academic activities  
 Source of reference: Own Elaboration

Likewise, students were asked if teachers use technological tools to teach their class?. The result of this question 23.4% of teachers use technological tools and 76.6% only used Microsoft Teams, Google MEET and ZOOM for communication, the teacher must be aware of the role he plays in the group, we know that he is exposed to criticism or admiration.

The VLEs provide different tools that give technological support to the measure of the teacher, but it will depend on the skills and competence that he must promote a virtual environment in the classrooms.

Answer	Answer number	Result in %
It is used	446	81.5%
Not used	100	18.41

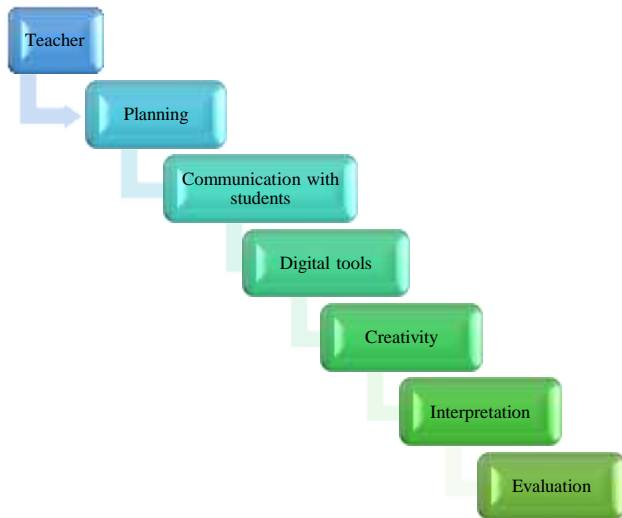


**Table 4** Percentage of students using technology in the classroom  
 Source of reference: Own elaboration

The teacher must meet the objective established in the didactic planning, the function of creativity is the design and development of activities that allow the teacher to evaluate the knowledge acquired according to the teaching process. The teaching process must have creativity on mobile devices, it cannot be explained only as a conscious, artistic or scientific process, as author Menchen Bellon says that you need to daydream, relax, allow the mind to extend to create new proposals that include multiple resources in virtual environments with emerging topics, current discussions and innovative ideas allowing the student to develop competencies and skills to solve any professional and work problem.

That is why the didactic elements of virtual environments with mobile devices must focus on a diagnosis, planning and evaluation during the reorganization and monitoring of the different methodological changes to teach the class online, that is, from a strategy and with technological resources they will form a didactic so that the teacher has a specific didactic for his subject. It is recommended to use a diagram that allows the exchange of creativity and technology in the classroom, as shown in Figure 2 below, shows how the teacher can support students to work collaboratively.





**Figure 2** Support model with the student  
Source of reference: Own Elaboration

The incorporation of technology and creativity will depend on the following important aspects for the teacher:

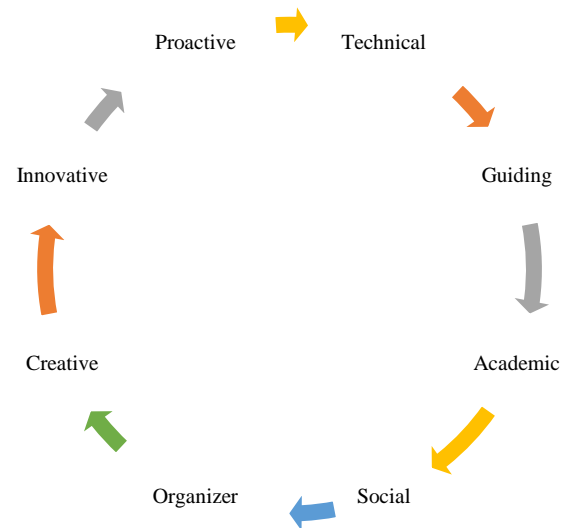
1. **Training:** the success of this is that the teacher who must be trained in the use of TICs to be able to teach, which implies designing, developing the course with the necessary materials to present them in the following modalities: face-to-face, mixed and distance. Likewise, students must be able to use TICs for their learning and produce didactic materials for the same purpose. You must also have the authorship of the institution of the materials that will be developed in order to have your own authorship.
2. **Infrastructure and equipment:** it is a necessary condition for the teacher to achieve an incorporation of TICs in the classroom.
3. There must be virtual teacher tutoring that allows stimulating participation inside and outside the classroom to free functions such as academic performance from which you must learn to respond virtually.

It must have the following functions:

1. Make sure you understand how it works.
2. Give academic advice.
3. Carry out formal activities of integration, communication, and creativity.
4. Stay in touch with the teacher and the student.
5. Support the student in virtual environments for their learning.

6. Gesture self-learning groups.
7. Work on social networks in the classroom as:
  - a. **Facebook:** which allows the creation of private groups to share content, create surveys and plan activities.
  - b. **Whatsapp:** it serves to form groups or subjects, solve doubts and give notices.
  - c. **Tiktok:** allows you to create videos in class and the transmission is direct.

That is why the tutor-teacher must have the skills and attitudes as seen in Figure 3.



**Figure 3** The skills and attitudes of the teacher-tutor  
Source of Reference: Own Elaboration

This will cause students to be proactive and able to learn and transform what they have learned to meet the needs of the digital age. The elements that make up a creative organization in the classroom, as shown in Figure 4, the awakening to a new knowledge that stimulates creativity, innovation to new skills and abilities, creating a society open to change capable of undertaking and responding to all professional and labor needs.

Technological creativity in the virtual classroom for the teaching of academic education, as author Waisburd Gilda says in the book *Creativity and transformation Theory and technique* indicates, (Waisburd, 2012), that the process of creative recovery consists of different stages, which appear simultaneously, or some stages before others, which depends on each person (student-teacher) or their personal moment.



When starting this research with the university centers it was thought that it would be in the same situation of the management of creativity with mobile devices in virtual environments in front of the classrooms, the teacher must generate strategies to promote and improve creativity, so that the student has the ability to reflect and analyze their own personal processes, is shown in Table 5,

P	Permanent quality	Quality is a direct, independent experience that predates any intellectual abstraction.
S	Shared enthusiasm	It is the sense of emotional intelligence incorporating to the members the value of feeling and emotion.
N	New technologies	It is the society connected in a ubiquitous way and based on mobility, fundamentally in the condition of communication and the active process.
W	Work with images	Having photographs of the future, the vision is a dream that is awake.
C	Continuous renewal.	It is a change of dimension and speed without any origin in history.
O	Objectives	It is an effective way to stimulate the process and help a long-term vision.

**Figure 4** Elements that compose and can be used in the classroom

Source of Reference: *Menchen Beelon, Francisco, La creatividad y las nuevas tecnologías en las organizaciones, editorial edición Diaz de santos, s.a.*

When starting this research with university centers it was thought that it would be in the same situation of managing creativity with mobile devices in virtual environments in front of the classrooms, the teacher must generate strategies to promote and improve creativity, so that the student has the ability to reflect and analyze their own personal processes.

Concepts	CU UAEM VM	CU UAEM Ecatepec
1. Creativity and innovation	39.10%	42.80%
2. Communication and collaboration	6.90%	5.50%
3. Research and management of information	5.40%	4.20%
4. Critical thinking, problem solving and decision-making	4.50%	3.50%
5. Digital citizenship	12.00%	15.20%
6. How mobile device technologies work and concepts	32.10%	28.80%
Total	100%	100%

**Table 5** Comparative result of the two University Centers on the development of technological competences in the two periods 2020B and 2021A of the University Center Valle de México and Ecatepec

Source of Reference: *Own Elaboration*

It is observed in table 5, the results on the capacities that the two University Centers have, but the UAEM Ecatepec University Center have a percentage of 80% higher than Valle de México, this allows to see that the capacities of the teacher are important to plan their courses of action, in the virtual environments using the creativity of the students, monitor the strategies you use, to evaluate productivity in terms of your students' results, so you have more often the instructions or tasks that help them reflect on their learning.

These two variables: the first Creativity and innovation and the second operation and concepts of mobile device technologies are related to the objectives of the research; the result has not been so favorable because the teacher-student does not develop an adequate planning; first to know about; while the second is to have the ability to do something; the teacher must plan the knowledge that is required to recognize the skills and processes of teaching-learning of which it will be taught, likewise must mold the skills and shape the skills that you want to teach and finally must exchange the knowledge with the students with their own experiences. It is proposed that in the two university centers they develop the content of virtual environments using the creativity of applications on mobile devices to integrate them as a collaborative work between the teacher and the student.

The authors Manuel Flores and Olga Gonzales in their book EL TRABAJO DOCENTE (Flores, 2014) explains a model of constructivist learning environment that must be implemented to improve student learning, five important elements should be used:

- **Positive interdependence:** Students should think that they are linked to their peers.
- **Face-to-face interaction:** Students should converse with each other and help another with homework.
- **Individual commitment:** Each student must be responsible, in their individual way as a group.
- **Social skills:** Students should interact with the group appropriately in the learning process.

- **Goal achievement process:** The group of students should regularly monitor what they have achieved and reflect on how the group or individual might function more effectively.

Cooperative learning is a good strategy for teaching-learning activities in virtual classrooms; by using this strategy will allow the student to have better knowledge, critical thinking and high metacognitive reasoning using creativity.

## Conclusion

The results obtained in this research show that the two University Center of UAEM Valle de México and that of Ecatepec in the three degrees:

1	Accounting career
2	Administrative Informatics career
3	Administration career

They show that the indicators of the six variables are not acquiring the knowledge and skills necessary to solve professional problems with the use of mobile devices in virtual environments.

Indicators	
1.	Creativity and innovation
2.	Communication and collaboration
3.	Research and management of information
4.	Critical thinking, problem solving and decision-making
5.	Digital citizenship
6.	How mobile device technologies work and concepts

Both had to have developed the skills and knowledge, which allow the student to excel in any area, these facts lead us to revalue again the skills and abilities since their function of the teacher-student is to generate new knowledge and skills that interact with creativity and mobile devices individually or as a team, make more aware of digital citizenship, as well as the operation and concepts of device technologies that indicate that there is no great difference to be analyzed.

There are some deficiencies that can be used and focused, channeled to guide students, to create critical and innovative thinking in decision-making in the use of devices and finally, there is a limitation in the present work is that when teachers-students return in person they will stop using technological means to teach their classes and will return to the traditional; and of which there will be no innovative change.

## Acknowledgement

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## Strategies to promote university permanence in times of COVID-19

### Estrategias para propiciar la permanencia universitaria en tiempos de la COVID-19

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#### Abstract

The research provides strategies that allow to promote school permanence at the Technological University of the Southeast of Veracruz (TUSV) during the period of confinement derived from the contingency due to SARS COV II. Information was collected from various sources: department of school services, tutoring and through a survey-type instrument with seventy questions, using the Likert scale and it was carried out to evaluate four tutorial areas experienced during the pandemic, such as: health, academic, socioeconomic, and personal. The survey was applied to 420 students out of a population of 1208, for which there is a level of confidence higher than 95%. Derived from the analysis of data on failure, monitoring of tutorials and tutorial areas, the diagnosis was made, generating a list of findings, derived from the above, strategies validated by a group of experts are proposed, such as: Establish an induction program for teachers and students, institutionalization of leveling courses related to the result of the entrance exam, creating the area of emotional support, Implementing technological tools for academic monitoring, establishing regularization groups, peer support, positive incentives for outstanding students, generating financial plans and establish a personal development program.

Strategies, Permanence, Desertion

#### Resumen

La investigación aporta estrategias que permitan propiciar la permanencia escolar en la Universidad Tecnológica del Sureste de Veracruz (TUSV) durante el periodo de confinamiento derivado de la contingencia por SARS COV II. Se recopiló información de diversas fuentes: departamento de servicios escolares, tutoría y a través de instrumento tipo encuesta con setenta preguntas, empleando la escala de Likert y se ejecutó para evaluar cuatro ámbitos tutoriales experimentados durante la pandemia, como son: salud, académico, socioeconómico y personal. La encuesta se aplicó a 420 estudiantes de una población de 1208, por lo que se tiene un nivel de confianza superior al 95%. Derivado del análisis de datos sobre reprobación, seguimiento de tutorías y ámbitos tutoriales, se efectuó el diagnóstico, generando una lista de hallazgos, con lo anterior se proponen estrategias validadas por un grupo de expertos, tales como: Establecer programa de inducción a docentes y alumnos, institucionalización de cursos de nivelación relacionados con el resultado de examen de ingreso, crear del área de apoyo emocional, Implementar herramientas tecnológicas para el monitoreo académico, establecer grupos de regularización, acompañamiento por pares, estímulos positivos a estudiantes destacados, generar de planes financieros e instaurar un programa de desarrollo personal.

Estrategias, Permanencia, Deserción

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## Introduction

In Mexico, one of the main objectives of the national educational development plan consists of "guaranteeing the right of the population in Mexico to an equitable, inclusive, intercultural and comprehensive education", for the foregoing; This work try to contribute to the priority objectives of the Education Sector Program 2020-2024. In this sense, it seeks to identify and propose support strategies that allow providing equal environments, identifying economic, social, academic, health and personal gaps to contribute to the student's permanence.

School dropout is usually frequent in higher education institutions and during the confinement period it has been increasing, according to what is mentioned in Statista (Statista, 2021) it is estimated to be more than 2.83 million students. This work try to identify reasons for dropping out, for this, information is reported from 14 educational programs, with the participation of 63% of men and 37% of women, evaluating four tutorial areas: health, academic, socioeconomic and personal, those were experienced during the period of Virtual classes, in the same way, data on failure, dropout, subjects with higher dropouts are analyzed, tutorial follow-up, in order to identify areas of opportunity that allow the generation of strategies that promote university student permanence.

## Theoretical Framework

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is an institution trying to establish peace through international cooperation in education, science, and culture. UNESCO considers that "education is a fundamental human right for everyone, throughout life, and that access to education must be accompanied by the quality". (UNESCO, 2021) This right to education refers to all educational levels, so the university environment is no exception. In this, the role of tutoring has not had the importance that it requires, it is usually taken as one of the teacher's activities, or like an assignment of a few hours to a tutor, but as Garzón says (Garzón Daza, 2018, p.98) if "it seeks to offer a positive response, it does not achieve the desired results, because the teachers do not have the necessary knowledge to carry out the tutorial work".

Considering the May 2020 publication by the World Bank Group in the article called COVID-19: Shocks to education and policy responses, "the COVID-19 (coronavirus) pandemic represents a threat to the advancement of education in all over the world", due to the closures of the educational centers and the economic problems faced caused by the governance strategies implemented. Therefore, it is imperative to work together with the board to counteract the effects produced by the pandemic, where the closure of schools increased the dropout rate and therefore inequity.

In 2021, in the publication by the World Bank "Acting now the Human Capital of Our Children: The costs and response to the impact of the COVID-19 pandemic in the education sector of Latin America and the Caribbean", mentions the unparalleled challenge faced today, being "an exceptionally difficult situation, which opens a window of opportunities to rebuild educational systems, trying to make them more effective, equitable and resilient." Similarly, the efforts made by countries such as: Uruguay, Mexico, Brazil, and Chile; to establish models of distance education, with the purpose of mitigating the consequences of school closures, including the high rate of student dropout at all educational levels.

Mexico worked with a multimodal strategy, "Learn at home", resuming an educational program launched in 1968, to support distance education for about 25 million students, this strategy includes a special radio modality to reach indigenous communities during the confinement stage. (World Bank, 2021), at the same time they also worked with digital resources, which represented a greater challenge due to the limitation of internet access in disadvantaged households.

According to what was mentioned by Dr. Lorenza Villa Lever, in her conference at the effects of a pandemic seminar, held on November 25, 2020, for the higher level in Mexico, distance education evidenced technological inequality, as well as the lack of technological and pedagogical skills in teachers, which represents an adaptation challenge for students, especially for vulnerable groups.

However, the application of strategies to contribute to the training of higher-level students were adapted by each educational institution, seeking appropriate platforms, providing guidance to teachers.

The application of strategies to promote permanence is essential in universities, so they must be implemented in an ideal way according to each situation, taking into account dropout, failure, areas of knowledge, tutorial environments (health, academic, socioeconomic and personal)

### **Problematic**

The tutoring program is one of the fundamental components of student service, is recognized by the accrediting centers, the Council for the Accreditation of Higher Education (COPAES), since they point out that tutoring is essential to evaluate the educational quality by means of the attention and follow-up of students.

According to the National Association of Universities and Institutions of Higher Education (ANUIES), tutoring is defined as: A process of accompaniment during the training of students, which is specified through personalized attention to a student or a small group of students, by competent and trained academics for this role, conceptually relying on learning theories rather than teaching. Given the above concept, the TUSV has tutors, who are involved in the accompaniment process for the detection, orientation, channeling, monitoring, evaluation, and analysis of student situations, to provide timely attention and improve the services offered by the institution.

Tutoring is an accompaniment process whose objective is to guide the TUSV tutors in the academic environment to facilitate autonomy in their comprehensive training, however, to achieve this, the tutor must have the training that allows knowing the student's status or the ability to consign to the corresponding area.

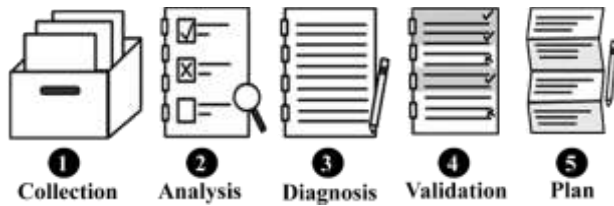
Accompaniment at the upper secondary level should not be degraded, since the young person is in a process of intrapersonal growth, maturity, autonomy and decision making, so the tutor acts as a guide in the academic and university environment.

Throughout the 18 years, since the creation of TUSV, until the present time tutoring has been done, however, with this research project it is intended to show a pattern that allows identifying factors that affect academic performance, causing failure or school dropout. Is important to point out that some of the dropout factors are related to the vocational profile, which defines interests, aptitudes, personality and abilities that a person has with respect to the choice of the university career, other factors intervene such as economic, family, social and personal (Calvache, et al, 2018) so that, it is tried to generate suitable strategies in the university, relevant according to the current scenario caused by COVID-19.

The COVID-19 pandemic caused by the SARS COV II, new coronavirus is, without a doubt, the greatest transformation presented in the education sector worldwide. Most of the educational systems took as a health prevention measure, the closure of institutions, from the first case at the beginning of 2020, with this the arduous work was undertaken for the change of modality, being "an emergent adjustment due to the health context, where Information and Communication Technologies (ICT) were used to face the situation" as Miguel Román (Miguel, 2020, p14 mentioned)

### **Methodology**

The object of this work can serve as a diagnosis, characterization, validation of its results through its indicators. Five processes were followed to carry it out: compilation, analysis, diagnosis, validation, and plan. The collection consists of the acquisition of data, this is done from three sources: school services, student services and an instrument applied to students. The analysis tries to identify the contribution of value in the data, regarding vulnerability and risk, with the diagnosis the parameterization is sought, to obtain a list of findings in the data collected. Validation is the work with expert personnel to refine findings and review strategies to select the appropriate ones. The plan is the result of the bibliographic and experience-based documentary strategies selected to promote student permanence from four angles: health, academic, socioeconomic, and personal at TUSV.



**Graphic 1** Model to structure strategies that promote student permanence at TUSV

### Data Collection

The population under study consists of 1208 students enrolled in the TUSV in the period May-August 2021. In accordance with the above, the population sample was determined by means of the equation “for studies whose main variable is quantitative” (Barojas, 2005):

$$n = \frac{N Z^2 S^2}{d^2 (N-1) + Z^2 S^2}$$

N = population size = 1208 students

d = margin of error (5% = 0.05)

Z = standard deviation according to the confidence level. (95% = 1.96)

S<sup>2</sup> = variance of the study population (0.5)<sup>2</sup>

The instrument "Tutorial Areas" was executed in 34.6% of the student population, which corresponds to 420 students of the 292 required to obtain the 95% confidence level and with a margin of error of 5%, the greater the number of applications it increases by confidence level and decreases the margin of error.

The design of the “Tutorial Areas” collection instrument has seventy questions, the Likert scale was used, which allowed getting information on: educational program, origin information, total number of people in the home, characteristics of their personal and economic situation, academic, social; health status, availability of technological tools among other variables, covering health, academic, socioeconomic, and personal areas.

Regarding the information on "monitoring of tutorials", it was compiled from April 26 to 30, aimed at students enrolled in the 14 educational programs: having a confidence level of 95%. The applied instrument covers points such as: assistance, empathy, orientation, remission, follow-up, educational strategies, communication, resilience, and ethics.

On the other hand, academic data were obtained from 2018 to 2020, on: dropouts and reasons for withdrawal, for each educational program, number of students for each failed subject, high school of origin.

### Analysis of data

The data collected from the survey carried out on the population sample is analyzed to determine the situation of the students during the period of confinement, identifying situations in the areas of health, academic, socioeconomic, and personal, tutorial situation, as well as failure rates, subjects with higher failure, failure frequency and origin of the students.

The analysis process of different variables is carried out, the comparative graphical method, parametric statistics is used to determine the highest frequency, the highest degree of acceptance or the situation most experienced, in this way to obtain parameters for the generation of permanence strategies.

### Diagnosis

After the analysis, a series of situations were identified that allow generating a list of existing problems in the student population to turn them into strategies that allow to promote permanence. For the generation of the diagnosis, the identified opportunity areas were grouped according to the four tutorial areas: Health, academic, socioeconomic, and personal.

### Validation

For the validation, it is suggested to work by consulting experts, "with the necessary assessment of no less than 30 subjects" (Añorga, et al, 2008, p.27), who identify themselves as expert personnel in the study area, where they issue its assessment regarding the strategies proposed, these strategies being bibliographic documentary and based on experience. For this, a group of experts with 6 teachers, 14 tutors, 3 external experts and 7 managers is used.

### Strategic plan

After the review by the experts, the plan is written with the strategies identified that allow the permanence of the students, considering the focus of efforts and prioritization of actions.

## Results

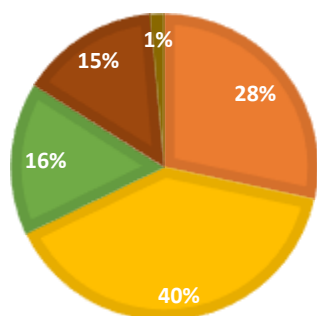
With the application of the model described above, the following data were obtained during the confinement period:

On health, the following elements stand out:

- 34.8% of the population have been a confirmed case of SARS COV II.
- The emotions with the greatest presence in students are despair (12.28%), sadness (12.12%) and anguish (8.86%)
- The predominant feelings perceived in confinement are stress (39.51%) and anxiety (28.37%)
- 10% of the population suffers from some type of disease such as: asthma, anemia, cancer, anxiety.
- 34.52% are overweight.
- Alcohol intake in young people increased by 2.84%

### Situations Presented in confinement

■ Anxiety ■ Stress ■ Depression ■ Nerves ■ Violence



**Graphic 2** Situations presented during the pandemic

### Academic filed

- Majority origin from high school.
- Most of those enrolled come from public schools, however, the income of students from private institutions has been increasing.
- 28.9% of the students coincide in virtual classes with a family member.
- 60% share the virtual classroom space.
- 54.63% use the smartphone as an educational tool.
- Internet service is mentioned as the first factor of absence from school.
- Lack of promotion of consultancies or regularization activities

- Students rarely or never report academic problems to tutors.

It is important to identify the main causes of desertion to approach them adequately, which is why the following data is presented:

- The September - December period is when there is the greatest number of withdrawals, with new students being the predominant ones.
- In 2018 there were 513 casualties, in 2019 it decreased to 354 and in 2020 only 346.
- From 2018 to 2020, dropouts due to failure are the main reason for dropping out.
- The dropout due to failure in 2018 was 343, 2019 237 and 2020 of 258 students respectively.
- In 2018, the educational programs (EP) with the highest loss due to failure were: Higher University Technician in Industrial Maintenance (HUT IM), Higher University Technician in Mechatronics and Higher University Technician in Industrial Chemistry (HUT IC).
- In 2019, the EP's with the highest failure rates are: HUT IC, HUT IM, HUT Automotive Mechanics (HUT AM)
- In 2020 they are: HUT IC, HUT IM, HUT Mechatronic (MT), HUT Accounting (HUT C) those with the highest disapproval.
- The areas of knowledge with the highest frequency of failure are:
- Industrial Maintenance Engineering (IME), Mechatronics Engineering (ME), Chemical Process Engineering (CPE) - was the Scientific Training and Information Technology Engineering (IEI) is the area of technological training.
- The areas of Technological Training represent the main cause of failure for HUT IM, HUT IT, management skills in HUT MT and HUT IC, Basic Sciences applied for the EP HUT in Accounting.

The subjects with the highest failure frequency by educational program are IME - Mathematics for Engineers II (2018), Mathematics for Engineering (2019), Environmental Management (2020).



HUT IM- Computing (2018), Sociocultural Training IV (2019), Sociocultural Training I (2020).

MTE- Mathematics for Engineering (2018), English VII (2019).

HUT MT- English II (2018), Oral and Written Expression (2019), Computer Tools (2020)

CIE - Mathematics for Engineering (2018), Mathematics for Engineers II (2019), English VII (2020).

HUT IC - Basic Chemistry (2018), Sociocultural Training (2019), Basic Chemistry (2020).

ITE – Integradora (2018), Administración del tiempo, redes LAN WAN (2020).

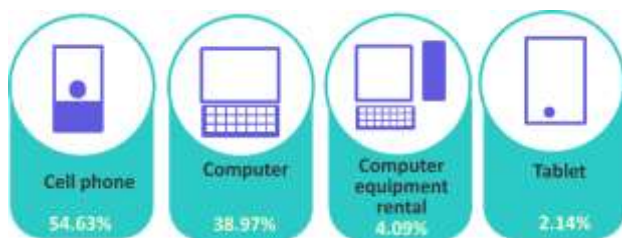
HUT IT - Database, programming, administration of the IT function (2018), English and sociocultural training III (2019), Programming (2020).

HUT Administration - Computing (2018 and 2019), Mathematics I (2020).

HUT C- Mathematics (2018), Computing and Mathematics (2019), Management Fundamentals and Mathematics (2020).

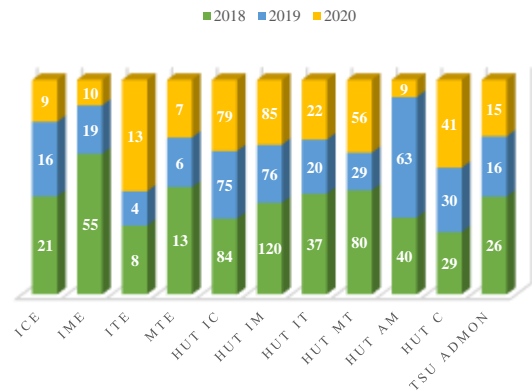
HUT AM - Computer Science (2018), English I (2019), Strength of Materials (2020)

- Among the reasons for dropout, the change of university and / or change of residence is the second cause.
- The third reason for dropout is the non-completion of the registration process.
- The area of scientific training is the one with the highest dropout rate.



Graphic 3 Device used as an academic tool mostly used in virtual classes

Dropout from 2018 -2020



Graphic 4 Dropout from 2018-2020 by educational program

In the socioeconomic field

- The origin of the students is from the city of Coatzacoalcos and congregations.
- The origin of the students is usually from places with a low and very low degree of marginalization; however, the localities of their municipalities are classified as having a high or very high marginalization index.
- Economic and family health factors have affected student performance, this being a common factor in Latin American countries, such as Argentina, as described by Anaís (Roing & Blanco, 2021), where confinement, loss of jobs evidences the precariousness of life.

Higher enrollment of students by location						
Location		2018	2019	2020	Total	Degree of Marginalization
Acayucan	Veracruz	10	20	7	37	Midium
Agua Dulce	Veracruz	63	68	85	216	Very high
R.cabada	Veracruz	47	16		63	Midium
Chinameca	Veracruz	11	36	13	60	Midium
Coatzacoalcos	Veracruz	884	791	563	2238	Very low
Allende	Veracruz		6	44	50	Midium
Cosoleacaque	Veracruz	55	21	52	128	Low
Cuichapa	Veracruz	1	2	32	35	Midium
Hidalgotitlán	Veracruz	19	14	11	44	High
Ixhuatlán del Sureste	Veracruz	180	80	163	423	Midium
Jáltipan	Veracruz	39	8	20	67	Midium
Las Choapas	Veracruz	37	15	13	65	High
Matías Romero	Oaxaca	7	2	6	15	Midium
Minatitlán	Veracruz	132	216	78	426	Low
Moloacan	Veracruz	109	24	43	176	Midium
Nanchital	Veracruz	565	536	369	1470	Low
Oteapan	Veracruz	4	1	15	20	Midium
Santa María Jalapa del Marqués	Oaxaca	2	2	16	20	Midium
Zaragoza	Veracruz	9	9	6	24	Very high

Table 1 Degree of marginalization by locality of enrolled students

In the personal sphere:

- The decrease in school performance is associated with distractions at home.
- Support for family sustenance has been the main trigger for school dropout thinking, followed by the loss of a family member.
- 38.5% comment that they need emotional support.

The diagnostic information shows the main situations faced by the students of the TUSV during the period of confinement, so strategies are established that adapt to the current situation that promote the permanence of the students in the institution, these were classified according to with the four areas investigated, it should be mentioned that it does not eliminate the problems completely, it will be necessary to generate new strategies according to their evolution.

Consequently, from the diagnosis obtained, the group of experts validated strategies that provide possible solutions to the problems to promote the permanence of the students.

Strategies to promote university student permanence.

#### Health

- Create an area of emotional support.
- Implement group therapy
- Offer an identification and monitoring program for students in risky behaviors.

#### Academic

- Implement a technological tool for timely academic monitoring.
- Strengthen the tutorial action of peer support, as a means of regularization to mitigate the lag.
- Strengthen synchronous and asynchronous accompaniment.
- Update the tutorial process for the selection and evaluation of tutors.
- Tutor training program.
- Create regularization program through consultancies, led by full-time professors.
- Give positive encouragement to outstanding students.

- Implement learning strategies, identifying learning channels in students.
- Training teachers in the design of material according to the learning channels.
- Teacher training for the development of b-learning material.
- Create an induction program for teachers and students based on the educational model, evaluation process and institutional services.
- Strengthen the academic leveling course with topics that derive the diagnostic test to strengthen the basic areas of knowledge.
- Include in the quality management system the risk and / or vulnerability report by identified subject.
- Languages within the working group for each educational program.

#### Socioeconomic

- Continue with financing plan.
- To assign scholarships considering the degree of marginalization according to the origin of the student and priority areas of attention.
- Consider the scholarship to students who are part of peer regularization.
- Create economic incentives for participation in curricular activities.
- Strengthen the stimulus program that promotes academic excellence.

#### Personal

- Create a program to strengthen the capacities of the student in their human formation process. (Espinoza, et al. 2020)

#### Acknowledgments

This work has been supported by, Master Julio Cesar Sandria Reynoso, and PhD Araceli Torres Medina, so the autor wishes to thank them because they contribute to grown up the investigation.

## Conclusion

This document describes the support strategies because of a propositional methodology, with a bibliographic, quantitative descriptive documentary design and based on the experiences of tutors, validated by a group of experts. With investigation is intended to adopt the strategies within the educational institution.

The following conclusions were produced:

1. The strategies to promote the permanence in the TUSV are oriented mainly to the academic field.
2. The inclusion of information technologies offers the availability of information and access at the time required for decision-making.
3. The regularization and peer support program offer an opportunity to students with lag problems to adjust their knowledge during the quarter.
4. Knowledge of the tutoring process will allow teachers and students to channel to the indicated areas and the use of the student services offered in the TUSV, in the same way, in the same way the accompaniment remains through synchronous and asynchronous activities.
5. The emotion management program will support young people who express the need for an intervention.
6. The purpose of financing plans is to support students targeted as vulnerable.
7. Establishing strategies by means of a group of experts allows obtaining results according to the current needs of the student.
8. By establishing support in the human formation process, it allows the integral formation of the student.

According to Torregiani and Alonso, the post-pandemic scenario is far from being resolved, not only is the incorporation of information technologies enough, but also the development and coordination of training processes with teachers (Torregiani Alonso, 2021).

Likewise, the coordinated work between the academic part, counseling, and student services are of vital importance for decision-making. (García et al, 2021). Understanding the causes of student dropout involves all the elements that intervene in the learning process, when young people dropout their studies, they abandon the possibilities of getting better opportunities, of cutting the stigma of income inequality and poverty. The social repercussions grow, since productivity and the rate of growth are diminished, as educational institutions must consider strategies that allow offering opportunities through far-reaching policies.

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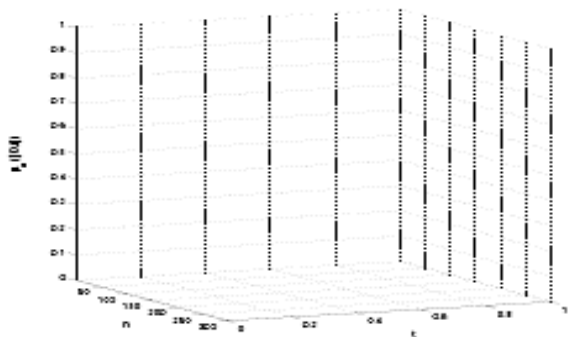
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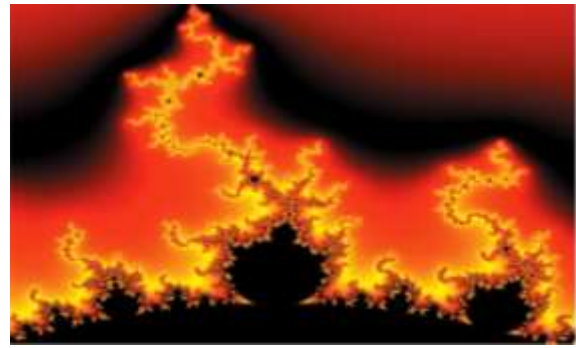
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