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Journal of Systems and Educational Management

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Presentation of the content

In the first article we present, *Analysis of the participation of the faculty in the PRODEP evaluation of a DES*, by TORRES-BUGDUD, Arturo, PALOMARES-RUIZ, María Blanca Elizabeth, SORDIA-SALINAS, Cesar and BÁEZ-VILLARREAL, Esteban, with adscription in the Universidad Autónoma de Nuevo León, in the next article we present, *Cognitive scaffolding model for project management that integrates the development of academic skills and a sustainable approach*, by GÓMEZ-LEMUS, Teresa de Jesús, PRIETO-USCANGA, Alicia, LÓPEZ-OSTRIA, María Teresa and PRIETO-USCANGA, Margarita, with adscription in the Instituto Tecnológico de Querétaro, in the next article we present, *Impact of the implementation of integrating evidence at the higher level: the Tabasco case*, by CARRILLO-CÓRDOVA, José Francisco, ABREU-TORIBIO, Luis Alberto, PERALTA-JIMÉNEZ, José Ramón and DE LA CRUZ-GONZÁLEZ, Flor, with adscription in the Universidad Politécnica del Golfo de México, in the next article we present, *An approach to online and face-to-face teaching and learning styles from the experience of the past confinement*, by ORTIZ-Y OJEDA, Pedro Tomás, SÁNCHEZ-ITURBE, Patricia Guadalupe, BASAVE-TORRES, Rosy Ilda and SALGADO-GUTIERREZ, María Catalina, with adscription in the Instituto Tecnológico de Tuxtla Gutiérrez, TecNM.
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Analysis of the participation of the faculty in the PRODEP evaluation of a DES

Análisis de la participación del profesorado en la evaluación PRODEP de una DES

TORRES-BUGDUD, Arturo†*, PALOMARES-RUIZ, María Blanca Elizabeth, SORDIA-SALINAS, Cesar and BÁEZ-VILLARREAL, Esteban

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Abstract
Quality is a fundamental issue that occupies educational institutions at all levels, not only nationally but also internationally, teachers, as well as education administrators, assume a leading role with society every day, seeking to achieve the desirable profile. For its performance, this work exposes the experience of the evaluation of teachers that is applied in Mexico, called PRODEP desirable profile in a Higher Education unit, with the support of the historical-logical method and the hypothetical-deductive method, the present document was carried out, when observing a decrease in its historical indicators, whose trend in annual participations was on the rise, being the reason for the present work its analysis and discussion.

Quality, PRODEP, Analysis

Resumen
La calidad es un tema fundamental que ocupa a las instituciones educativas de todos los niveles no solo a nivel nacional sino internacional, los docentes al igual que los administradores de la educación, asumen cada día un rol preponderante con la sociedad, buscando lograr el perfil deseable para su desempeño, en este trabajo se expone la experiencia de la evaluación a docentes que se aplica en México, denominada perfil deseable PRODEP en una dependencia de Educación Superior, con apoyo del método histórico-lógico y el hipotético-deductivo se realizó el presente documento al observar en sus indicadores históricos una disminución, cuya tendencia en las participaciones anuales iba en ascenso, siendo motivo del presente trabajo su análisis y discusión.

Introduction

With regard to the problem of quality in higher education. According to the OECD (2013), some of the explanatory causes of its problems are its massification in the last two decades as a result of the multiplication and diversification of institutions, the restrictions coming from public spending and the need to perfect a quality assurance system.

According to (Küster-Boluda & Vila López, 2012), higher education has forgotten or ignored university professors and their teaching practice in quality issues, since their role is highly relevant in the quality of professional training, which is why, against this background, a topic of interest is presented in terms of teaching performance, which is directly related to educational quality. Jeréz (2015) quotes Bain, (2004) quality teaching is that which is capable of provoking extraordinary learning in students, that is to say, a permanent intellectual and personal development over time.

Bustos, (2015) cites (Bozu & Canto Herrera, 2009), stating that when we talk about the professional profile of teachers, we are referring to the set of competences that identify the training of a person. Furthermore, it points out that they are the main actors for the strengthening of the PE, therefore, a fundamental factor in the planning and evaluation that contributes to the vision and guidelines of any HEI is the quality teaching profile.

The development of this document is in reference to the participation of the teachers of a Higher Education Unit (HEU) in the annual call issued by the Ministry of Education (SEP) in Mexico to obtain the recognition of the desirable profile of the Professional Teaching Development Programme (PRODEP), whose objective is to analyse, with the support of the database records that the HEU has, The aim is to analyse, with the support of the DES database records, aspects such as its evolution, the intervening variables that may influence the indicators of its academic capacity, and once detected, to take future actions, so it is convenient to determine the requirements to be met by the teacher who intends to achieve the desirable profile in accordance with the operating rules issued by the government for this evaluation (DOF 2020).

It sets out as its objectives:

- To train human resources at higher and postgraduate level, as well as researchers in all areas of knowledge, who can respond to current requirements and have a favourable impact on the resolution of problems that contribute to regional development and community links.

- To promote scientific research, technological development and innovation, as well as culture and links with society.

- Promote training programmes at degree, specialisation, master's and doctorate levels, relevant to local, regional, state and national conditions, aimed at training professional-citizens committed to the economic, social, territorial and cultural well-being of peoples, communities and neighbourhoods at community, regional and national levels, whose activities contribute to promoting a process of valuation, strengthening, revitalisation and empowerment of native languages and cultures from a critical intercultural perspective, in order to contribute to the elimination of socio-territorial inequalities.

According to the Official Journal of the Federation (2020), it establishes that full-time professors (PTC) who satisfactorily fulfil the university functions and give evidence of this in the period of 3 years prior to the current year apply to this call.

The general requirements to obtain the recognition of the desirable profile in accordance with the rules of operation 2022 are:

- To have an appointment as Full-Time Lecturer (PTC), with a minimum seniority of one year, prior to the publication of the call for applications.

- To have obtained the preferred degree (doctorate) or minimum (master's degree).

- Demonstrate in a reliable manner their activities as shown in figure 1.
There is a decrease in the participation of teachers to be evaluated to obtain the desirable profile. There are intervening variables that influence the decrease in participation.

This model explains 78.73% of the variation of the data in the tables presented, in which it is possible to estimate the amount of desirable profile that there is in each certain amount of PTC.

Historical-logical: Its application allowed the analysis from several angles: the historical one that made possible the analysis and assessment of the subject studied through the sources related to the object of study, with the help of this method it was possible to detect the research problem, its evolution, and the trends that are presented in its evolution and development (Centy, 2010).

Documentary analysis: The use of this method favoured the study of documents related to the requirements of the evaluation programme, theories of the teaching profile, including the analytical-synthetic processing of the source (Dulzaides & Molina, 2004).

Analysis and synthesis: The analysis consisted of the separation of the various realities involved in the research problem, the elements involved and how they are inferred from each other, after which the synthesis was carried out by integrating each element into a set of proposals that are relevant to the analysis of the problem (Bajo, 2004).

The synthesis, by means of the databases and the participation trajectories, integrates the possible intervening variables, with the support of the graphs and trends, conclusions are proposed that will give rise to new studies.

Hypothetico-deductive: the use of this method made it possible to propose a hypothesis as a consequence of its inferences, the observation of facts and the analysis of empirical data, principles and/or more general laws.

Hypothesis

There is a decrease in the participation of teachers to be evaluated to obtain the desirable profile. There are intervening variables that influence the decrease in participation.

This model explains 78.73% of the variation of the data in the tables presented, in which it is possible to estimate the amount of desirable profile that there is in each certain amount of PTC.

Methodology

This research took as a method a review of qualitative data with the support of Power Bi software to be used in the statistical model of linear regression with the support of MiniTab software. This same software was of support to create an analysis of means, using the T Student test method to statistically compare the significant data in the number of teachers with desirable profile of PRODEP and check more accurately the meaning of the decrease of data in recent years compared to past times, giving us a conclusion in which the reliability index is still high to have a minimum margin of error to the study that is intended to study.

To take into account the completion or in-progress status of the activity in 2022, a maximum start in 2019 will be considered.

It is important to mention that none of the four required activities can be substituted by any of the others.

The evaluation and selection of the beneficiaries will be carried out with the support of peer committees, from the areas and disciplines of knowledge of the applicants, convened for this purpose by the SES. The expert members of the peer committees will be selected preferably from among high-level academics with proven experience in the evaluation of the National System of Researchers (SIN), the Ministry of Culture and the National Council for Science and Technology (CONAHCYT).

Figure 1 Requirements to obtain the recognition of the desirable profile according to the rules of operation

Source: Own elaboration

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With reference to the two hypotheses, Ho being the null relationship between the data and H1 being the correlation of the presented data, we can conclude that hypothesis 1 (H1) contains sufficient evidence to be significant. It is estimated that approximately 26 CTPs have a Desirable Profile and given that the reliability is 95% it can be confirmed that the conclusion of this model is of sufficient confidence and demonstrable according to the process used.

On the X-axis are the PTC and on the Y-axis are the Professors with PRODEP.

This model explains 78.73% of the variation in the data, so it is a good predictor. With this model it is possible to estimate the amount of desirable profile with X amount of PTC. The standard deviation of the model is 26.23 PTC are desirable profile. Since the value of Fisher’s cumulative tables is F0.05,1,15=4.54; and this is less than the F value of the ANOVA; with 95% confidence there is sufficient evidence to reject the Ho, therefore, the model expresses a significant simple linear regression between the number of PTC with the Desirable Profile as shown in graph 1.

When the analysis was done, taking into account the regression equation, the coefficients and the analysis of variances, it was possible to plot the corresponding linear regression together with the variation of data based on the mean, letting us know that, although in the last four years the number of PTC with desirable profile has decreased, the PRODEP programme remains stable and the data remains correlated with the other without any interference to the contrary (H1 is not rejected). Also, the analysis was done with 95% reliability, demonstrating that the model has accurate and demonstrable data for the study (Figure 3).

**Regression equation**

\[
\text{Desirable Profile} = -292.5 + 1.287 \text{ PTC}
\]

**Coefficients**

<table>
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<th>Term</th>
<th>Coef</th>
<th>EF the Coef.</th>
<th>Value T</th>
<th>Value p</th>
<th>FIV</th>
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<tr>
<td>Constant</td>
<td>-292.5</td>
<td>68.4</td>
<td>-4.28</td>
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<tr>
<td>PTC</td>
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<td>0.173</td>
<td>7.45</td>
<td>0.000</td>
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**Summary of the model**

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<th>R-CUAD. (PRED)</th>
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<td>S</td>
<td>23.2687</td>
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**Analysis of Variance**

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<td>55.52</td>
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<tr>
<td>PTC</td>
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<td>8121</td>
<td>541.4</td>
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<td>TOTAL</td>
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<td>38180</td>
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</table>

**Figure 3** Regression equation

*Source: Own elaboration*

The DES undertook some strategies to motivate the participation of its professors, as this has an impact on its indicators, by giving courses and workshops, personalised advice on how to fill in the call for applications, including the new PTCs. Figure 4 illustrates the strategies that the DES has employed to motivate the participation of teachers, including new PTCs.
Results

In the databases of the Unit’s professors, various variables were studied, such as the age of the PTC and their participation in the Call, where participation is observed on a par in the age range of 30 to 40 years of age, that is to say 20 professors who do not have the profile and 20 who do have it, in the age range of 40 to 50 there were 70 who have not achieved the Profile and 103 who did in the year 2022, in the range of 50 to 60 there are 45 PTC who do not have the profile and 67 who did obtain it, while people in the range of 60-70, 27 teachers do not have the desirable profile and 29 who do have it, and in the age range of 70-80 2 teachers do have the profile and two do not, these factors can be further analysed in another study, it can be seen in graphic 2.

Another variable that was analysed is the seniority as PTC and their response to the call for applications, since in this data analysis, although the numbers in the comparison seem to be equal (63 and 60), the teachers who have the Profile and those who have not achieved it are in the range of 5 to 10 years of seniority; however, this number should be worked on continuously to encourage participation. In the range of seniority as PTC from 10 to 15 years, 59 teachers have the profile and 21 teachers still do not have it, in the range of seniority from 15 to 20 years, 42 people do have it and 21 people do not, these data are significant because it will be necessary to encourage teachers with less seniority to participate in the evaluation, this can be seen in graphic 3.

Another variable that was analysed in the 2022 database is the categories that the professor achieves in the tabulators of the UANL, predominating the greater number of PTC in the category of Titular A, nevertheless the population that will have to be applied to achieve it are the categories of Associate A and B since they are the professors that will continue developing to future, with particular emphasis will contribute to increase the indicators of the academic capacity of the dependency, as it is shown in graphic 4.
This graph shows by categories according to the Human Resources tabulator where the largest number of PTC is distributed, with a predominance of tenured category A with 104 professors who have the desirable PRODEP profile.

Source: Own elaboration

Another variable that was analysed in the database is the degree of studies of the PTCs, with the highest number of PTCs with the Profile appearing in Doctorate, more than in Master's degree, which should be emphasised in those who do not participate in the call or who do not have the Profile, as both should work to strengthen the indicators of academic capacity, to be considered in the future by the DES, as shown in graphic 5.

Graph 6 shows the evolution of the participants in the evaluation of the desirable profile from 2008 to 2022.

Conclusions

According to the 2022 analysis, there were several variables that intervened to consider a decrease in the participation of the call, among which we can list the following:

- The age factor of the participants who consider that it is no longer appropriate to allocate time to academic production.
- The seniority factor, this approach applies to young full-time professors who have recently been appointed and have not published and to older professors who have decided not to publish.
- Decrease in the period 2021 which coincides with the pandemic.
- Changes in the dates of the call for proposals due to renewal of the governmental body.
- Retirements and departures caused by the pandemic.

These results give rise to continue with further research and to be able to emphasise possible alternative solutions that contribute to the academic capacity of the agency.

References


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

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

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Abstract

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

Holistic cognitive scaffolding model, Competencies for Life, Sustainable engineering

Resumen

Objetivos: Con el propósito de orientar el desarrollo de proyectos de investigación con enfoque sustentable, que permita resolver la dialéctica entre el caos y la oportunidad, que plantea el desarrollo tecnológico se desarrolla un modelo de andamiaje cognitivo, aplicable al desarrollo de proyectos de cualquier campo del conocimiento. Este andamiaje se plantea como un modelo sustentable en sí mismo, al integrar la formación por competencias como estructura principal y como parte correspondiente al pilar o esfera de lo social; el análisis de ciclo de vida, indicadores y otros temas medio ambientales componen el pilar o esfera de lo ambiental y la parte tecnológica y comercial conforman el pilar o esfera de lo económico. Metodología: Se plantea una investigación documental y cualitativa para la conformación del modelo de andamiaje, el cual se valida por medio de la aplicación a un caso concreto. Contribución: Con una visión holística, que integra la sustentabilidad y la formación por competencias, se logró un desarrollo tecnológico que integró conceptos clave determinantes para su diseño, construcción, funcionamiento y visión de mercado. El modelo es una guía que estructura la información básica vigente en la agenda mundial, flexible permitiendo incorporar el marco teórico específico del proyecto en cuestión.

Modelo de andamiaje cognitivo holístico, Competencias para la vida, Ingeniería sustentable

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Introduction

In the experience of one of the members of this working group, who has been teaching the subject of Sustainable Development for at least 12 years, despite the fact that it is common to observe that what generates fear, discouragement and the perception of pointing to the technology of current goods and services as responsible for environmental deterioration in the vast majority of students, it was considered important to intervene in this dialectic of chaos and transform it into an opportunity by posing the following question: Is the development of new technologies also the way to reverse this situation?

The subject of Sustainable Development, which is taught in all the study programmes offered by the Tecnológico Nacional de México, is a propitious field for exposing and analysing with students the different problems related to the climate crisis, the overexploitation of resources, the damage to ecosystems, the effects on human health, economic crises and social problems.

The starting point is to consider that the task of the teacher is to raise the problem, but also to offer the tools of knowledge and provisions that strengthen students to contribute to the construction of bridges that connect the chaos with the opportunity to offer possible solutions, reorienting the focus of technology, with a holistic vision and conscious, responsible, respectful and benevolent participation towards people and the environment. The added value of this proposal is to integrate in one image the purposes of Education by Competences and Sustainable Development with the addition of some tools for continuous improvement.

This article presents a cognitive scaffolding model for the management of sustainable research projects, which is structured mainly by integrating the four pillars for education in the 21st century, proposed in the Delors Report presented to UNESCO in 1996, also considered as fundamental learning or competences for a person’s life, as well as the concepts of Sustainable Development and the 2030 Agenda.

The central hypothesis is that the Scaffolding Model offers a roadmap that influences student awareness in order to rethink the objectives of technological developments towards projects that address current social, economic and environmental challenges and contribute to Sustainable Development.

For the purposes of this article, a brief theoretical framework will be described to provide a guide to the concepts proposed in the model; in their real application, these concepts must be studied in depth by each student for their project and expanded in order to understand them better.

Also for its didactics in this article, the scaffolding model will be explained based on the application to a case of technological development carried out by a postgraduate student, CONAHCyT scholarship holder, arguing the qualitative analysis that was applied.

Finally, the results and conclusions obtained will be discussed.

Conceptual framework

Delors Report

The main structure of the scaffolding is based on the Delors Report presented to the UN by the International Commission on Education for the 21st Century in 1996, entitled “The Four Pillars of Education”; Knowing How to Understand, Knowing How to Do, Knowing How to Live Together and Knowing How to Be. However, the task of education is to know how to transmit to the individual the freedom to be continuously swimming in information that is constantly changing, being alert to currents that can threaten and damage existence in different areas, as well as to provide the guidance and tools necessary to analyse it and implement the knowledge acquired in individual and collective projects that promote general well-being, with the best intention that these competences serve the individual throughout his or her life [1].
Competences

The competence-based approach underpins the educational model proposed by the Tecnológico Nacional de México, identifying those of BEING, associated with the development of soft skills, which require internal work of motivation for a subsequent drive towards materialisation. Those of UNDERSTANDING, which contribute to the acquisition and generation of knowledge about the phenomena of the environment. Those of DOING, as those that translate that knowledge into facts, and that of LIVING, related to the interaction with others, typical of a life in society.

Brundtland Report and Agenda 2030

For any type of project, it is considered necessary to know the Our Common Future Report or also known as the Brundtland Report presented to the UN in 1987, in which the Commission that studied and elaborated the report integrated social, economic and environmental development into the concept of Sustainable Development, defining it as that which "meets the needs of the present generation without compromising the ability of future generations to meet their own needs" [2].

The Brundtland Report sets out the intention, but it is through the 2030 Agenda that the 17 goals and 169 targets of Sustainable Development can be specifically placed [3].

Circular Economy

Some countries that have already made progress in the approach of projects considered as sustainable, have shared their experience and implementation, one of which is being widely accepted and used in Europe and Latin America, is the "Circular Economy" approach, the principles of this approach are mainly to avoid the extraction of resources and raw materials by reusing those already in circulation and to promote the use of renewable energies [4].

Life Cycle Assessment

Life Cycle Analysis is an important topic to understand that the responsibility of offering a product in the market is not only the commitment to sell, the perspective is from where the resources that the product will require are obtained and even what will happen to it, once it reaches its obsolescence [5] and [6].

Continuous improvement tools.

The Deming Cycle contains the stages that must be considered every time you want to start a project or improve it, that is why it is also known as the Spiral of Continuous Improvement, the stages are: Plan, Do, Check, Act or PDCA: Plan, Do, Check, Act [7].

Lean Manufacturing is a method of work organisation, well known in industry, that seeks to continuously improve and eliminate any type of waste or action that does not add to the process, optimising costs and time. In fact, the concept is applicable even to other goods or services, as it is closely linked to the Circular Economy [8].

5 s Classify, Organise, Clean, Standardise and Keep Improving, are the Spanish translation of Seiri, Seiton, Seiso, Seiketsu, Shitsuke, are actions to be performed, it is a tool within Lean Manufacturing, whose mission is to optimise the work environment to promote continuous improvement and quality improvement, since working in a clean, orderly environment, avoids wasted time, travel and accidents in addition to motivating the mood increasing productivity and satisfaction [9].

Theoretical framework of the specific project

Of course, depending on the type of project in question, it will be necessary to obtain the relevant information. The topics suggested so far form the basic scaffolding for putting together a project with the characteristics required for a sustainable project today, and nurture the competences of knowing in order to understand.
Development

Figure 1, graphically expresses the scaffolding or the proposed methodology, integrating different knowledge and valuable tools in the field of engineering, management and human development, which have been developed by very different authors, from very different fields of knowledge and moments in human history. The competences to be developed proposed in the Delors Report are expressed in the perimeter ring, and in the inner space of the scheme, the questions or topics for reflection on the respective competence to be achieved. In the centre of the scheme, the project in question for each student Of course, depending on the type of project in question, it will be necessary to obtain the relevant information.

The model is explained below, together with a case in which it was applied. The project is related to the spaces where sorghum is stored, where rodents are present, which is not desirable since it contaminates the product that is used for animal and human food and additionally the economic losses that its disposal implies because it does not meet the conditions for consumption.

This project was developed by a student from Cd. Victoria Tamaulipas, as an option to obtain a master’s degree in engineering, in the programme offered by the Tecnológico Nacional de México, Instituto Tecnológico de Querétaro, who already knew about this problem in his home town and even had the support of farmers to develop a solution, which kept him focused, committed and motivated to carry out the research project.

Competence development

Competences for BEING

The proposed model starts at the development of these competences and ends at the same place, i.e. at the beginning of the project the student and the teacher are according to the initial information in one way and at the end of the study it is very likely or desirable that they will have changed. At the start of the project it is important to recognise that there is a motivation to carry it out, with the vision of serving society, which does not, however, preclude an economic gain from the work.

Competences for UNDERSTANDING

To acquire this competence, each student proceeds to search and find the information suggested in the conceptual framework of this article, related to sustainability and adding others according to the topic of the specific project, analysing, synthesising and finding the integration of the concepts for the development of the project.

The proposal of this scaffolding model arises from the concern to rethink technology and make it a great ally. In the field of technology education it is important to reflect on the technology and science applied in the production of goods and services and also on its probable collateral damage to the economy, the environment and society, for which Life Cycle Analysis helps. This analysis considers the technological development from considering the raw material to be used in it, through the manufacture, sale, transport, use and disposal of it, since usually only a short-term benefit has been considered.

Nevertheless, the Model considers it very important to incorporate soft competences for learning to live together and learning to be, as they have generally been underestimated due to the economic benefit, the success of the projects will be based on balancing individual and collective interests in the different social, economic and environmental interactions that each person carries out. However, these types of competencies seem to be divorced from technical-scientific knowledge, when in fact it would be appropriate to recognise this need.
The optimal qualities for achieving Sustainable Development are expressed in the intersections in Figure 2: keeping the planet habitable by satisfying the needs of society requires a balance between the biocapacity of the planet and the demands of some social groups; making the interaction between economy and environment eco-efficient requires to stop thinking that the planet's resources are infinite, to learn not to waste them and to promote their recovery; achieving equity between the social and the economic sphere is possibly the most complex part because it will come from moving the heart of each individual towards a new consciousness that finds its rapture in sharing and helping the general wellbeing.

Figure 2 Balance between the spheres or scenarios of Sustainable Development
Source: [3]

In the case of the electronic rodent repelling device project, the student had already considered the technological development of a device to prevent the presence of rodents in sorghum warehouses, but the investigation of the conceptual framework served to visualise the scope and qualities of the device.

A brief analysis from a Sustainable Development perspective considering economic, social and environmental factors is explained below.

Analysis:

- Applying the sustainability approach from the social sphere, we reflected on the consequences of the presence of mice in these warehouses; damage to health due to contamination by faeces and urine.

- From the economic sphere, the economic losses due to the loss of contaminated grain were observed, and it was also found that the problem is not exclusive to warehouses, nor to sorghum in particular, which positions the project with a wide market share.

- Looking at the problem from the environmental sphere it was considered that mice are part of the food chain of other species, therefore it was decided to scare them away and not exterminate them.

Summary:

Although there are already devices on the market for this purpose, the student and the people who needed to solve the problem had already tried them and determined that they did not have the required signal range and results; the proposal from the Sustainable Development approach was:

- From the economic sphere, a patent search was carried out to review what legally exists in the market and not to incur in controversies. Also, in the construction of the prototype, a simple design was sought and the use of parts that offered greater durability was sought, as well as the selection of companies supplying inputs that were committed to sustainability (if this information was available).

- In the environmental sphere, as already mentioned, the premise was not to exterminate them and not to have noise pollution due to the device emitting a continuous signal, for this reason, the technology that was developed was so that the device would recognise the rodents and after recognition, the device would emit the signal that would scare them away, additionally it was added that it would work with photovoltaic cells, which makes it versatile for use regardless of whether or not electricity is available and avoids the emission of greenhouse gases caused by the consumption of electricity.

- The contribution in the social sphere is to provide a solution that keeps rodents away from the product that will be consumed by animals and humans.
The time and research resources applied to the project, as observed in the analysis, can have a wide yield and field of application, considering the multiple places where this technology can be applied.

Under these design premises, it was considered to include in the theoretical framework, the knowledge of neural networks, which is the basis for the device to recognise the specific presence of rodents.

In relation to the 2030 Agenda, Figure 3, several goals were addressed; 3 Health and well-being, 7 Affordable and clean energy, 8 Decent work and economic growth, 9 Industry, innovation and infrastructure, 12 Responsible production and consumption and 15 Life of terrestrial ecosystems.

Figure 3 SDGs: Sustainable Development Goals
Source [3]

Aligned to the Circular Economy, opportunities to reuse, repair, remanufacture and recycle were considered; applying in the project a simple and easy to repair design and implementation of photovoltaic cells for the operation of the device [10].

Competences to DO and continuous improvement tools

For the development of these competences it is suggested to start:

- Being clear on the objectives of the project, on what you want to do and achieve, on the action plan (first part of the Deming cycle), on the support required from others and how to contribute.

- Aligning your excitement about the project, expressing verbally and clearly structured what you expect from the project, in less than five minutes.

Working to a plan and schedule of work.

Incorporate useful engineering tools such as Deming Cycle, Lean Manufacturing and 5 s, which are used in industry, and as the person becomes familiar with them, they permeate the person and they apply them in other activities of daily life, Figure 4.

Figure 4 Tool 5 s
Source [8]

In relation to the project in question, applying the Deming cycle tool: Plan, Do, Check and Act, a work programme was planned from the start, taking into account the goals for the construction of a prototype.

Often the availability of resources for the materialisation of projects is complicated, scarce and not timely, under these premises, it is clear that it is necessary to learn to work with Lean Manufacturing, eliminating waste and optimising costs, whatever the project in question.

Competences for LIVING TOGETHER

The proposed scaffolding sets out the objectives and reflections that favour the development of knowledge and know-how in order to acquire knowledge of the technical and economic aspects of projects.
However, in order to understand and implement in parallel the competences that could be the missing ingredients for the development of technology in the future, the model proposes incorporating reflections in relation to ethical values, as these are the ones that can change the course of current goods, services and production systems and that the power to apply them lies in the hands of each individual consumer or producer.

Projects, however good they may be, depend very much on the mastery of applying soft skills and sustainable results depend on ethical values and knowledge. At each stage during project development, performance refers back to Universal Values, from the position in which each person is involved, the model considers that in the background among the problems in all the scenarios of Sustainable Development is the lack of application of universal values, which have confused and diverted humanity, putting material gains before the gains that sublimate the human spirit.

Results

The cognitive scaffolding model proposed in this work is a methodological proposal with instruments to address the development of technological projects, with design parameters based on the economic, social and environmental conditions surrounding the project, with innovation and quality [11], incorporating central aspects in the training of students: sustainability and development of competences. In addition, it also allows the incorporation of continuous improvement tools that organise the generation and execution of projects, without falling into rigidity, allowing its application in different types of projects.

In the reference project, developed by a postgraduate student supported by a CONCYT grant for his master's studies, the technology used was for the recognition of mice, for the emission of signals and, additionally, it was added that it should work with photovoltaic cells. In the construction of the prototype, its life cycle was analysed and a simple design was sought, using parts that offered greater durability, as well as selecting suppliers in the production line that were friendly to sustainability (if this information was available) [12]. Figure 5 shows a worksheet prepared by the student, showing the aspects analysed.

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Conclusions and future work

The projects are important, but even more important is the training of professionals with criteria of sustainability, ethics and quality, to make technology a viable way to solve some of the activities of human beings without collateral damage.

As an area of opportunity we have, that not always the same student who develops the technology, is interested in carrying out the commercialisation of their projects, so this offers the opportunity to integrate other types of projects under the same approach of sustainability but oriented to form a value chain around the projects that are generated in these environments, since also in many of the events such as the expo-engineering, the intellectual property of the same is put at risk.

References


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

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

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Abstract

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

Competencies, Higher level, Integrative evidence

Resumen

El proyecto final brindó información relevante para apoyar las actividades docentes de las instituciones que sirvieron como muestra de esta investigación- Universidad Politécnica del Golfo de México, Universidad Vasconcelos de Tabasco, Universidad Juárez Autónoma de Tabasco (División académica multidisciplinaria de Comalcalco), Instituto tecnológico superior de Comalcalco- la aportación al campo educativo servirá para incrementar la calidad de las clases, los resultados muestran la realidad en las aulas, la percepción de los estudiantes, de los docentes y de los administrativos que colaboran en esta comisión. Al iniciar el proyecto se sabía que no sería fácil desarrollarlo por todos los inconvenientes presentados, para al final resulta de mucha satisfacción el hecho de tener un material de apoyo para la toma de decisiones. La falta de colaboración, trabajo en equipo, ha venido incrementándose en las organizaciones principalmente cuando se habla de un proyecto en donde se requiere de estos aspectos fundamentales.

Competencias, nivel superior, evidencias integradoras

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Introduction

The research work presented below aims to analyze the advantages and disadvantages of applying the integrative evidence in higher level students in the region of the Chontalpa in the State of Tabasco, to show if they get a good learning and effective development based on their skills. Why the university sector? Because one of the essential functions besides transmitting knowledge through the teaching-learning process by means of the use of the integrating evidences, making known the form of teacher-student evaluation. In the search for information for the present research, in addition to elaborating the theoretical framework, we offer the data obtained from official sources of different authors specialized in the subject with respect to the problem in question. On the other hand, the empirical evidence is based on field work with the support of different data collection instruments, including a questionnaire and an unstructured interview. The questionnaire was applied to a sample of teachers and students from different higher education institutions in the Chontalpa region.

Statement of the problem

It is essential to know the advantages and disadvantages of the use of integrative team evidences in higher level students in the Chontalpa region in the State of Tabasco, since a few years ago a new educational model based on competencies was implemented, where the abilities, values and skills of students in higher schools are tested. It is necessary to know the important factors that allow the application of the integrative evidences based on competences, which would be the students, teachers and essential academic personnel that are the important value and that role occupies each one so that an integrative evidence can become functional in the student’s learning.

Method

Type of research: Qualitative and Quantitative.

Results

Results of the surveys carried out (those which, in the authors' opinion, provided clear and precise information for the proposal for improvement in the different educational institutions will be included)

In question three: In your school transit have you participated in an integrative evidence? The answers were the following:

Data collection techniques Surveys and interviews.

Theoretical framework

In the general process of design, implementation and evaluation of the new curricula, focused on the learning of competencies to which the implementation of the European Higher Education Area (EHEA) has led us, multiple questions arise. Almost inevitably, the first questions we must answer are related to what competencies must be acquired in a given profession and how these competencies must be demonstrated in the workplace and personally. For this reason, in the reports of new undergraduate and postgraduate degrees, competencies are defined as clearly as possible, i.e., the knowledge, behaviors and aptitudes that must be acquired or put into practice in the professional practice for which the profession qualifies. However, proposals for evaluating the achievement of the results obtained in the acquisition of these competencies are not often included.
1. UJAT (Multidisciplinary Academic Division of Comalcalco) 68% said that they have participated in integrating evidences and 32% said that they have not done any evidence in collaboration with their classmates. When analyzing the percentages that come out of the surveys we observe that every day it will be necessary a better integration of the students, motivated by the professors so that they can experience this collaborative work and demonstrate that it has multiple benefits in addition that it contributes to bring them closer to what happens in the working life. In this particular institution, working in this way is a necessity since, for example, a surgeon to perform an operation or consultation requires other collaborators to do a good job, as well as a nurse or a physical therapist.

2. ITSC (Instituto Tecnológico Superior de Comalcalco) 90% said that they have participated in some integrative evidence and 10% mentioned that they have not. Something that could be observed in this Institute is that most of the students have had some contact with this type of evidence and have sought collaboration not only with their peers in the same classroom but also with other related careers that have common objectives. The curious thing is that in the two previous questions, a considerable number of students mentioned not knowing about the competency-based model, which affirms the comment about the lack of information and interest on the part of the students to learn about aspects of the educational model of the institution, but also about the teaching and administrative part.

3. UPGM (Polytechnic University of the Gulf of Mexico) 75% mentioned that they have participated in these evidences and the remaining 25% said that they have not. Once again, the concern arises that in a University that is born under the competency-based model, a large percentage of students mention that they have not worked in this spirit of collaboration. We insist that it is a shared work, from the authorities to the teachers when they are induced to the model upon entering the institution. These data should be used to analyze those processes that are disjoined.

4. UVT (Universidad Vasconcelos de Tabasco) 80% said that they have experienced collaborative work through evidence and 20% have not participated. Being a private institution that offers a mixed modality in its classes, it can be seen that students have greater participation in joint activities, which increases the possibilities of a better insertion into working life. Although we cannot leave aside the percentage that mentioned that they do not know this type of work.

We affirm that when working collaboratively, common objectives can be achieved more easily, and competencies and skills are developed that permeate the school and work environment unquestionably. Creating a culture of support is not an easy task; many times people do not work at the same level as others and only wait for someone else to develop their work. Organizations demand people capable of seeking consensus and empathy in common, the organizational climate through collaboration facilitates coexistence and allows the benefit in every way.

In question 6: How important do you consider the application of integrative evidence? The opinions were:
1. UJAT (Multidisciplinary Academic Division of Comalcalco) 40% thought that they are very important, 31% consider that they are important, 8% little important and 21% consider that they are not important at all. The responsibility that individually is required for the practice of the evidences as a whole we have observed has multiple variations, 70% of the students of this University consider that it has been relevant to carry them out in teams and they have achieved greater benefits, but the sector of those who do not put their greatest effort will never see concrete results due to their lack of commitment.

2. ITSC (Instituto Tecnológico Superior de Comalcalco) 45% said that they are very important, 40% considered that they are important, 10% said that they are not very important and 5% said that they are not important at all. For the Institute, the students' responses should be an important aspect to take into account, since almost 80% considered that they have received benefits from participating jointly and therefore it is important that teachers encourage this type of evaluations, thus facilitating opportunities for personal and collective growth.

3. UPGM (Polytechnic University of the Gulf of Mexico) 59% mentioned that they consider them to be very important, 23% considered them to be important and 18% considered them to be not very important. These results are satisfactory because it is proven that the joint evidences bring benefits for students and teachers, fostering human relations and mainly the vision for working life. The efforts will never be in vain. The students of this University affirm that they have had great satisfaction and are in the best disposition to continue with this work dynamic.

4. UVT (Universidad Vasconcelos de Tabasco) 60% said that it is very important to carry out joint evidences, 30% said that it is important but with its restrictions, 8% said that it is not very important and 2% said that it is not important at all. In this University, we should remember that it is a semi-school system, so the high percentage of students see greater benefits in team evidences in order to have better results, they are adults and with a different workload.

The importance we give to teamwork together with personal responsibility are very variable factors, for those who are not used to do their school work effectively this aspect could be easy, for those who have a greater commitment to their education it is not difficult at all, but it is proven that it will always be better to work in a team defining roles and responsibilities.

Discussion

The importance of establishing a positive relationship between the teacher and the student in the teaching-learning process under the competency model at the higher level, the objective of this project has been to analyze the advantages and disadvantages of the use of integrative evidences in the IES of the Chontalpa region. It is important to emphasize that the way in which professors apply the integrative evidences allows students to make a self-analysis regarding their knowledge and provides them with opportunities for improvement when doing collaborative work, in addition to this, we know that the University is the bridge to the working life and they must integrate in this aspect to improve the work.

Conclusions

It is possible to conclude that there is a high level of students who know the advantages and disadvantages of the integrative evidences, as well as a low level of students who do not know about it. The exposed throughout this research, looking for if the students in diverse institutions have knowledge of the advantages and disadvantages of the integrative evidences as a whole.
During the research process, the objective was to know the impact of these evidences and to know more in depth if the institutions of higher education apply the integrative evidences as a way to evaluate their students, with this gap of knowledge the samples were made and the surveys and interviews were applied. On the other hand, when comparing the results of the surveys (applied to students) and interviews (applied to teachers) of: Instituto Tecnológico Superior de Comalcalco, Universidad Politécnica del Golfo de México, Universidad Vasconcelos de Tabasco and Universidad Juárez Autónoma de Tabasco (División Académica Multidisciplinaria de Comalcalco), a high level of interest on the part of the students to know about the integrative evidences as a whole is observed.

References


An approach to online and face-to-face teaching and learning styles from the experience of the past confinement

Un acercamiento a los estilos de enseñanza y aprendizaje en línea y presencial desde la experiencia del pasado confinamiento

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Abstract

The characterization of teaching activities with online materials, methods, and strategies prior to the pandemic and currently in person, allows contrasting the development of the teaching process in two different environments and their corresponding activities developed by teachers to achieve competencies in students who are studying Basic Sciences in careers such as Engineering, in this research some of those experiences lived during confinement are recovered.

Resumen

La caracterización de las actividades de enseñanza con materiales, métodos y estrategias en línea previamente a la pandemia y actualmente en forma presencial, permite contrastar el desarrollo del proceso de enseñanza en dos ambientes diferentes y sus correspondientes actividades desarrolladas por los docentes para lograr las competencias en estudiantes que cursan las Ciencias Básicas de carreras como Ingeniería, en esta investigación se recuperan alguna de esas experiencias vividas durante el confinamiento.

Pandemic, Confinement, Skills


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Introduction

Three years later, when humanity was afraid and the world isolated itself to protect itself from something that was not yet known for sure what it was, communications between people became digital. School activity stopped around the world, in Latin America and the Caribbean region schools were closed for about 58 weeks and 170 million students suffered the effects on their education. It is estimated that the pandemic caused one to eight years to be lost in the learning process (World Bank, 2020; UNESCO, 2022; UNESCO, 2022a and 2022b).

According to Martínez (2021) and Mamani-Cori et al. (2021), due to this pandemic, educational systems moved from being face-to-face and traditional to a virtual environment, where different aspects appeared among the actors of the educational process, teachers and students, around the institutional and socio-economic environment to develop the pedagogical process.

In the case of most teachers, they faced significant technological challenges, because they are not generationally “digital natives” (with innate ability of language and the digital environment), which made it difficult for them to appropriate digital resources and the elements that define the pedagogical approach and teacher-student interaction.

In the students, despite being virtual natives, the socio-economic effects weighed on them, since many lacked technological devices and adequate connectivity, which strongly influenced the learning process and especially the high dropout rate; they adapted the contents found in the computer networks, which were selected according to the teacher's value judgment, sometimes without being socially relevant and almost always referring to the didactics and pedagogy of the face-to-face process (Linne, 2021). In addition, the lack of elements of emotional containment, the need for interaction with student peers, gender, and the face-to-face action of personal attention and counseling, etc., was noted (Villela, 2021).

In Mexico, the return to the new normality was announced on May 13, 2022, however, three years after the onset of the disease, the results of the damage caused are still not clearly defined, hence the importance of conducting studies in each of the important areas of human endeavor, such as education, health, work, etc., to identify the effects and their consequences in the different aspects of daily development.

According to ECLAC (2020), the chronology of the pandemic and its development can be considered as the existence of a relationship in time between pre-confinement and confinement and educational practices carried out without technological elements, on the other hand, post-confinement in face-to-face form, with technological elements and their combination, called hybrid or mixed form; in addition to distance teaching with the elements of communication and information technologies. According to Bonal and González (2021), in pre-confinement, teaching was exercised by means of expositions, explanations and constant feedback of the contents, which should have an adequate order for the pedagogical exercise, virtues that distance education lacks. Classroom teaching with and without technology was present, however, the use of technology was not extended throughout the educational environment for reasons of socially and economically disadvantaged environments, generally due to the lack of a good internet connection.

During the confinement, García (2021), education was carried out at a distance, being totally digital, which originated a completely deficient learning, which has repercussions in learning effectiveness and its sequels of the lack of development of skills, competences and adequate behaviors to achieve educational success, which can lead to school dropout or abandonment.

Post-confinement is developing with hybrid practices in the school environment, which are characterized by a greater number of students, ranging from a few to a complete massification of the educational exercise.
In these different stages of the pandemic and its effect on education, there is a conductive element, the so-called didactic material, which is related to teaching-learning, which facilitates the process, and awakens the student's interest in appropriating the content and its components favor the teaching work of the pedagogical process (Bonilla, 2020).

In this research we try to categorize materials, methods and strategies used by students and teachers in two times during their studies online, face-to-face and hybrid, exploring the most significant of the variety of traditional and electronic devices, which are being developed in different supports in order to apply the pedagogical intentionality to expand the contents and, most importantly, to acquire the competencies and their attributes indicated in the educational program.

**Methodology**

The following fundamentals that affect the experimental methodology are established, since it is considered that the careful selection of resources and materials that the teacher makes for the development of the contents and educational designs, must comply with the competencies and with them develop the teaching-learning process.

So that the content to be created has the possibility of being simple, and that it is within the objectives set for the design of the class, which in most cases is oriented to practice with a series of exercises, which in some way exercises and develops metacognition on learning and self-evaluation.

It is also important to know the way in which this selection is made by the teacher, and the way he intends to develop the educational process, as well as the theoretical concepts related to the subject and how they are established to acquire the knowledge, skills, attitudes, abilities, skills and values, contained in the competences of the study program; and with what didactic material he develops the contents, depending, if the teaching process is face-to-face or distance, that is, two groups are established in the process of inquiry.

The measurement to be made is to assign values to the didactic materials according to whether they were used during the distance or face-to-face teaching process in terms of the following levels of measurement:

1. - Strongly disagree
2. - Disagree.
3. - Neither agree.
4. - nor disagree.
5. - Agree.

An important value of the data is the average value, or mean of the observed data from the sample or population, observed by the teachers surveyed, to establish the organization and summary at this stage of the value count.

The level of measurement is considered ordinal in this study, since it has as an outstanding element the transitivity to establish hierarchies, in which the distance from one value to another is not equal.

In the dependent variable, the attribute to be measured are the factors of competencies, knowledge, abilities or skills and values of the competency that are developed according to the didactic or educational materials that can be working, informative, illustrative and experimental.

Work material includes elements to write on, as well as projectors, computers, calculators or geometry tools.

Informative material is books, magazines, dictionaries, and audiovisual material is understood to be videos, slides, and experimental material is everything that can be used to carry out tests and trials.

In the case of classroom or distance groups, these can be considered as the unit of analysis, which is also considered as an independent variable, establishing that the samples are taken from the teachers who taught various basic science subjects during the pandemic and the semester immediately following the return of the contingency.

To consider these two situations, it is necessary to establish a significance level, also called $\alpha$ level, which indicates the probability of being wrong when testing the established statistical hypotheses.
In our case, the level of 0.05 is taken, thus considering that there is 95% safety to generalize without making a mistake and 5% in the opposite case, which is to make a mistake.

Thus, the following hypotheses are established:

Null hypothesis: The didactic materials used have the same effectiveness to develop the factors of the competences in classroom and distance learning.

Alternative hypothesis: The didactic materials used do not have the same effectiveness in developing the competency factors in face-to-face and distance learning.

Type I error can be considered to be committed when the null hypothesis is rejected if it is true and type II is to accept the null hypothesis if it is false. When committing type I error, it is considered that there is a difference between the groups, when there is not.

This is considered a serious error, which should be taken into account because it is expected that when a treatment is carried out, differences between the study groups will arise.

In general, it is established that the value of the test must be greater than or equal to that given in the table to reject the null hypothesis; however, in the statistical packages of computational type, when taking the level of significance, if this is considered so that if it is less than or equal to 0.05 the hypothesis is rejected.

Taking into account that the research develops a theme of comparison of groups or measurements with an independent variable and a dependent variable, which is measured only once in the unit of analysis of two groups where the variable is scalar, and taking into account that, when quantifying ordinal variables, these do not add up, but when having the results of the test they can be considered as an interval variable which can be added up.

In addition, the selection of the elements was completely random, considering the homogeneity of the variances of the dependent variable of the two groups, complying with the normal distribution in this variable.

Thus, the Student’s t distribution is the appropriate distribution to compare the arithmetic means of the scores of the two groups and to determine that this difference is not a product of chance, that is, that it is significant.

Cohen's coefficient (d) is also used to determine whether the relationship between variables is strong or weak, between the factors of competence and the face-to-face and distance groups. Considering values between 0 and 0.20 weak, 0.21-0.50 modest effect, 0.51-1.00 moderate effect and greater than 1 a strong effect.

Results

In the questions asked, it is intended to know some aspects of distance education during the period of confinement and afterwards, during the return to face-to-face activities, in the particular case the use of didactic material for the development of competences.

It can be considered Alvarez, De La Riva (2021) that the use of certain didactic elements has been present, both in the face-to-face stage and in the case of the distance stage, the case of the blackboard, the less intense use at a distance is observed, which is complemented with the use of a camera to take the images of the blackboard, and with the use of other audiovisual elements used at a distance, in both cases its use is identified with the average in both questions.

The underlying element in this situation is the handling of technology, as some teachers had to make real efforts to adapt to the use of these devices.

Again, in the questions related to the use of books as an element to develop the concepts in the competencies, the mean is higher than the use of computer programs, in spite of being a distance learning process, evidencing the lack of skill and confidence in the use of technology for the development of competencies on the part of the teachers.
The development of the ability to do something correctly Gómez et. al. (2021), is called skill, in some subjects of basic sciences, chemistry and physics this is developed through laboratory practices, however, in distance learning the didactics to fulfill this function is limited by the intrinsic characteristics of the pedagogical process that characterizes this teaching modality.

This situation has a response with a positive correlation, when laboratory practices are developed, according to the answers of the professors regarding the analyzed topic.

Also the aspects of carrying out a punctual research by the students, are developed with basic elements of book type and scientific magazines, in both with a positive correlation since they are considered reliable components to carry out and answer a question or doubt, as estimated by the teachers who answered the questionnaire.

Despite the use of technologies that are present to develop a particular topic, there must be a systematization process that is represented by the application of the scientific method, a point of view that is reflected by a high correlation especially in the face-to-face teaching activity in contrast to the distance one.

In another of the questions, it is implicitly recognized that an organization of information is necessary to develop learning, implicitly denoting the existence of the scientific method in the teaching structure for learning.

In the development of ethical values, Santillán (2020), uses the method of explaining the meaning of these with respect to the person, society and culture, observing that the process is better valued when it is carried out in person than at a distance, through a certain amount of activities to develop the meaning through the use of examples.

The existence of face-to-face activities is fundamental for the development of teaching and the subsequent application of values by the students, as indicated by the averages of values, which contrasts with the distance activity, in which the teacher does not have the opportunity to develop the topics and explain them in a lively way.

Regarding the development of problem-solving skills, there is a dichotomy of methodologies and teaching activities, since some concepts are easily illustrated with examples in audiovisual equipment in distance learning, however when the activity is face-to-face, emphasis is given to the use of books or notes to have the didactic development of the topics to be presented during the pedagogical activities, this appreciation is evidenced in the results shown by the statistical data of the means and distribution collected in the study samples.

The teachers recognize that values are learned in the face-to-face activity, as well as the process of exchange of ideas that are carried out, whether at a distance or face-to-face, however, the process of significant learning of this type of knowledge is preferred in face-to-face teaching.

It can be mentioned that the activity of making a previous approach to the learning activity by means of the investigation of the concepts has a significant impact on the acquisition of knowledge, so that it is estimated that it has an impact on the learning time and its comprehension. This consideration is established both in the face-to-face activity and in the distance learning activity.

As previously mentioned, the teaching of values is carried out by means of lived experiences, that is to say that the student must experience the existence of these situations in a face-to-face manner so that with the acquired experience he/she can discern the ethics implicit in this pedagogical action.

In addition, the acquisition of concepts is better done in a face-to-face manner than at a distance, especially due to the existence of elements of human interaction in the knowledge learned, as estimated by the correlation established by the statistical process developed.

As a result of the analysis of the answers, it can be established that the student needs the presence of the teacher for the development of his knowledge, the development of autonomy in learning is directly related to the student's commitment in his integral formation in his education.
Conclusions

According to the panorama found in the research on the contrast between face-to-face and distance learning styles, it can be observed that both activities have advantages for the development of certain types of knowledge.

As well as with the use of didactic materials to develop each teaching and learning activity, since each activity is related to different factors among which we can recognize the knowledge of communication and information technologies, as well as the skill developed by the teacher in the handling of these.

There is also a significant preference for certain didactic materials that are present in the teaching process, since in many cases it is considered that the use of books is more adequate to investigate knowledge than the information that exists in the digital network.

This position generates certain attitudes towards the pedagogical development of the teaching activity, as well as the consequences of the techniques or tactics implemented for the appropriation of knowledge, skills and values.

In the case of knowledge, its learning activity is perfectly developed with the use of technologies, since it incorporates elements and perspectives that are naturally incapable of being offered by other didactic materials, so the teacher is the one who receives the responsibility of defining the pedagogical developments of the didactic strategy used.

As a consequence, the teaching activity is determined by the type of interaction carried out, in a face-to-face or distance way, as well as by the strategies used, which are defined by the availability of the didactic material present and the capacity to develop it in a face-to-face or distance way.

Thus the fundamental characteristics that define post-pandemic teaching are related to the availability of materials, methods and teaching strategies that are used accordingly.

Recognizing that the teaching activity, after the pandemic achieved that the activities are carried out in a more pragmatic way, because when the use of technology is necessary for the development of a teaching strategy, this is done with the available technological elements and other traditional elements, used before the pandemic that originated in 2019.

There was also a change in the attitude of teachers with respect to technology, achieving in many cases an approach through the need to perform the pedagogical act of teaching classes at a distance, an action that is achieved through accelerated training of these knowledge and skills.

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ORTIZ-Y OJEDA, Pedro Tomás, SÁNCHEZ-ITURBE, Patricia Guadalupe, BASAVE-TORRES, Rosy Izda y SALGADO-GUTIERREZ, María Catalina. An approach to online and face-to-face teaching and learning styles from the experience of the past confinement. Journal of Systems and Educational Management. 2023

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