# 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

ORTIZ- Y OJEDA, Pedro Tomás*†, SÁNCHEZ-ITURBE, Patricia Guadalupe, BASAVE-TORRES, Rosy Ilda and SALGADO-GUTIERREZ, María Catalina

*¹Instituto Tecnológico de Tuxtla Gutiérrez, TecNM, México.*
,

ID 1st Author: *Pedro Tomás, Ortiz-Y Ojeda* / **ORC ID**: 0002-3796-8504, **CVU CONAHCYT ID:** 205520

ID 1st Co-author: *Patricia Guadalupe, Sánchez-Iturbide* / **ORC ID:** 0000-0002-9245-3725, **CVU CONAHCYT ID:** 976780

ID 2nd Co-author: *Rosy Ilda, Basave-Torres* / **ORC ID:** 0000-0002-7305-3897, **CVU CONAHCYT ID:** 720064

ID 3rd Co-author: *María Catalina, Salgado-Guitierrez* / **ORC ID:** 0009-0004-1974-2474, **CVU CONAHCYT ID:** 68623

**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.

**Pandemic, Confinement, Skills**

**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.

**Pandemia, Confinamiento, Competencias**

* Correspondence to Author (E-mail: ptoyomx@yahoo.com)
† Researcher contributing as first Author.

## 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 5.

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 α 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.

ORTIZ- Y OJEDA, Pedro Tomás, SÁNCHEZ-ITURBE, Patricia Guadalupe, BASAVE-TORRES, Rosy Ilda and 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

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.

## References

Álvarez A., De La Riva Lara, J. (2021). Experiencias de aprendizaje durante 2021 la pandemia COVID-19 en la Universidad Pedagógica Nacional" p. 379-394. Vol. 19 No. 2 (abril-junio). Recuperado de https://bit.ly/3TxvpKo el 1 febrero del 2023.

Banco Mundial (2020). Covid-19: impacto en la educación y respuestas de política pública. Washington, DC: Banco Mundial. Recuperado de https://bit.ly/3JWDHbW el 11 de marzo del 2023.

Bonal, X., González, S. (2021). Educación formal e informal en confinamiento: una creciente desigualdad de oportunidades de aprendizaje. Revista de Sociología de la Educación-RASE, 14 (1), 44-62. Recuperado de https://bit.ly/45if7K4 el 23 de marzo de 2023. http://dx.doi.org/10.7203/RASE.14.1.18954.

Bonilla, J. (2020). Las dos caras de la educación en el covid-19. Número Especial Desafíos Humanos ante el COVID-19 abril – octubre 2020. Recuperado de https://bit.ly/45kywKz el 4 de abril de 2023. http://dx.doi.org/10.33210/ca.v9i2.294

CEPAL (Comisión Económica para América Latina y el Caribe) (2020). La educación en tiempos de la pandemia de COVID-1. Oficina Regional de Educación para América Latina y el Caribe (OREALC/UNESCO Santiago).Recuperado de https://bit.ly/3lmGSjH el 12 de abril 2023

García, L. (2021). COVID-19 y educación a distancia digital: preconfinamiento, confinamiento y posconfinamiento RIED. Revista Iberoamericana de Educación a Distancia, vol. 24, núm. 1, 2021 Asociación Iberoamericana de Educación Superior a Distancia, España.Recurado dehttps://bit.ly/3QCCA4G el 12 de marzo de 2023. https://doi.org/10.5944/ried.24.1.28080

Gómez, N., Lima, J., Pedraza, D. (2021). Publicaciones científicas sobre educación en pandemia por COVID-19 y Lineamientos de políticas educativas internacionales. Revista Historia de la Educación Latinoamericana, vol. 23, núm. 37, pp. 185-205, 2021. Universidad Pedagógica de Colombia – UPTC. Recuperado de https://bit.ly/3n9JgdM el 3 de mayo de 2023.

Lancheros, M. S. (2021). Proceso de aprendizaje en la pandemia. Panorama, 15(28). Recuperado de https://bit.ly/3TuR2Lu el 12 de febrrero de 2023.

Linne, J., (2021). La educación del siglo XXI en tiempos de pandemia. Ciencia, Docencia y Tecnología, 32(62), 1-21. Recuperado de https://bit.ly/3nadRIc el 5 de marzo de 2023.

Martínez, A. (2021). Educación y enseñanza em tiempos de COVID-19. Revista Digital Universitaria. 22(1) enero-febrero 2021. Recuperado de https://bit.ly/443wdL0 el 30 de marzo de 2023. http://doi.org/10.22201/cuaieed.16076079e.2021.22.1.0

Mamani-Cori, V., Padilla, T., Cervantes, S., Caballero, L. & Sucari, W. (2021). Estrategias y recursos didácticos empleados en la enseñanza/aprendizaje virtual en estudiantes universitarios en el contexto de la Covid-19. Revista Innova Educación, ISSN-e 2664-1488, ISSN 2664-1496, Vol. 4, Nº. 1, 2022, págs. 78-91. Recuperado de https://bit.ly/3YtmOuShttps el 3 de febrero del 2023 DOI: https://doi.org/10.35622/j.rie.2022.01.006

Santillán, W. (2020). El Teletrabajo en el COVID-19 Número Especial Desafíos Humanos ante el COVID-19 Abril – Octubre.2020. Recuperado de https://bit.ly/443wdL0el 6 de abril de 2023. http://dx.doi.org/10.33210/ca.v9i2.289

Villela, F., Contreras, S. (2021). La brecha digital como una nueva capa de vulnerabilidad que afecta el acceso a la educación en México. Academia y Virtualidad 14(1), 169-187.Recuperado de https://bit.ly/3qrKxPy el 5 de febrero de 2023. https://doi.org/10.18359/ravi.5395

UNESCO (Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura) (2022). Brechas, deudas y logros. Lo que la pandemia revela sobre las Sociedades del Conocimiento en América. LatinaChair on Knowledge Societies and Digital Governance (Argentina), I-POLIS. Recuperado de https://bit.ly/3ZSxHGD el 3 de mayo de 2023.

UNESCO (Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura) (2022a). Educación en América Latina y el Caribe en el segundo año de la COVID-19. Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura, 7, place de Fontenoy, 75352 París 07 SP. Recuperado de https://bit.ly/3Z4dvjV el 5 de marzo de 2023.

UNESCO (Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura) (2020b). Informe de políticas: La educación durante la COVID-19 y después de ella. Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura, 7, place de Fontenoy, 75352 París 07 SP. Recuperado de https://bit.ly/3yTOQnq el 21 de marzo de 2023.