Perceptions of technological and didactic strategies for the teaching-learning process in the face of the COVID-19 pandemic

Percepciones de estrategias tecnológicas y didácticas para el proceso enseñanza aprendizaje ante la pandemia COVID-19

PÉREZ-GARMENDIA, Gloria†*, RICALDE-FRANCO, Gabriela, ZAPATA-DITTRICH, Abel and CETINA-UC, Pedro Pablo

Tecnológico Nacional de México campus Instituto Tecnológico de Mérida, Mexico.

ID 1st Author: *Gloria, Pérez-Garmendia* / **ORC ID:** 0000-0002-1215-0175, **Researcher ID Thomson:** G-3863-2018, **CVU CONACYT ID:** 291627

ID 1st Co-author: *Gabriela, Ricalde-Franco* / **ORC ID:** 0000-0002-6017-2192, **CVU CONACYT ID:** 954720, **PUBLONS ID:** AGY-2822-2022

ID 2nd Co-author: *Abel, Zapata-Dittrich* / **ORC ID:** 0000-0002-2583-7531, **CVU CONACYT ID:** 414742, **PUBLONS ID:** AGY-2726-2022

ID 3rd Co-author: *Pedro Pablo, Cetina-Uc* / **ORC ID:** 0000-0001-6111-8078, **CVU CONACYT ID:** 772690 **PUBLONS ID:** AGY-2797-2022

Abstract

The abrupt closure of schools due to the declaration of a pandemic by the World Health Organization caused by the SARS-CoV-2 coronavirus in March 2020, led teachers and students to seek strategies to continue teaching and learning in the way their skills allowed them to use digital platforms and tools in the teaching-learning process. There were those who faced with quite robust skills that allowed them to remain in a feeling of confidence to continue with their classes, others who were "run over by technology" were those who had feelings of incompetence to develop their teaching activities and those who suffered in their confinement, who were skilled in their subject, but were removed from their classroom. The type of research is based on phenomenology, (Martínez, 1999) within qualitative research, (Hernández, 2014) as a direct expression of the key informants, which allowed to describe, group and interpret the findings in the process of adaptation of a disruptive moment in the teaching-learning process in an academic department.

Strategies, Phenomenology, Pandemic

Resumen

El cierre abrupto de escuelas a causa de la declaratoria de pandemia por parte de la Organización Mundial de Salud provocada por el coronavirus SARS-CoV-2 en marzo de 2020, orilló a maestros y estudiantes a buscar estrategias para continuar con la enseñanza y aprendizaje de la manera como sus habilidades les permitían usar las plataformas y herramientas digitales en el proceso de enseñanza aprendizaje. Hubo quienes se enfrentaron con habilidades bastante robustas que permitió mantenerse en un sentimiento de confianza para continuar con sus clases, otros quienes les "atropello la tecnología" fueron los que tuvieron sentimientos de incompetencia para desarrollar sus actividades docentes y quienes sufrieron en su confinamiento, quienes eras diestros en su materia, pero les quitaron de su salón de clases. El tipo de investigación se basa en la fenomenología, (Martínez, 1999) dentro de una investigación cualitativa, (Hernández, 2014) como expresión directa de los informantes claves, que permitió describir, agrupar e interpretar los hallazgos en el proceso de adaptación de un momento disruptivo en el proceso enseñanza aprendizaje en un departamento académico.

Estrategias, fenomenología, Pandemial

* Correspondence to author (E-mail: gloria.pg@merida.tecnm.mx)
† Researcher contributing as first Author.

Introduction

Background

On March 16, 2020, instructions are given by the educational authorities to suspend face-to-face classes and to continue under the distance modality, due to the declaration of a pandemic by the World Health Organization regarding, the disease caused by the SARS-CoV-2 coronavirus, due to the danger it faced with the lethal and unknown virus until then. Situations like these multiplied in all schools worldwide, some research such as those carried out (Portillo-Peñuelas, S.A. Castillanos.Pierra, L.I.; Reynoso-González, O.U. y Gavotto Nogales, O.I. (2020)

The Technological Institute of Mérida had to close its doors to more than 5,000 students from the southeast of the country, both at the undergraduate and postgraduate levels, to a teaching staff of 380 teachers and 165 administrators, all of whom had to face drastic changes in their teaching practice. The results expressed were from an academic department of technology.

The use of virtual platforms in academic work

The studies carried out on digital platforms in recent years and proposed by several authors guide their research on the way in which communication technologies applied to education have evolved. with changes in pedagogical models, the option to use teaching strategies and methodologies that force the teacher to use the internet and technological resources as an alternative communication between education professionals and the educational community in general, on the other hand, learners who were born in the era of technologies are more familiar with these devices, their applications and internet connection, they expect the continuous and permanent updating of the teacher to improve educational processes. (Amón-Abad, C.E; Garcia-Herrera, D.G.; Erazo-Alvarez C.A. y Erazo-Alvarez, J.C (15 noviembre 2020).

Under these circumstances, given the vertiginous changes that occurred with the sanitary confinement due to the situation of the COVID-19 pandemic in March 2020, educational institutions had to implement urgent strategies to continue providing the educational service, for which there was a need to look for teaching alternatives relying on new communication technologies, as well as new, more flexible, creative teaching strategies that contrasted with traditional strategies, to make them available to students, seeking above all to be able to provide quality training by the times of the pandemic.

Prestigious institutions in the country determined strategies such as the creation of a class in Google Classroom developed departmental exams in Google Forms, PowerPoint presentations of the contents of the study programs (Luna Ramírez, F.E., Albor Calderón, M.G. and Groce Ortiz, A.T. (January-December 2021)

What problems in the teaching-learning process did the students, teachers, and administrators face? What teaching strategies should teachers apply when the school closed its doors due to the health contingency? What was the emotional situation found by teachers, students, and administrators? The objective is to approach from a general perspective, the perception of the academic-administrative coping strategies carried out at the higher technological level, the experience of the actions taken in the administrative-economic department at a critical moment to continue with the teaching-learning process. to higher education students whose educational facilities were closed from one day to the next.

What are virtual environments for learning?

Delgado Fernández, (2009) in Bello Díaz, Rafael Emilio (2005), calls virtual environments for learning "classrooms without walls", and affirms that it is a virtual social space, whose best current exponent is the internet, it is not face-to-face, but representational, it is not proximal, but distal, it is not synchronous, but multichromatic, and it is not based on spatial enclosures with the interior, border, and exterior, but rather depends on electronic networks whose interaction nodes may be scattered throughout various countries.

The Moodle virtual platform is a free course management system. CMS for its acronym in English is defined by Boneu (2007) as a system that facilitates content management in all its aspects: creation, maintenance, publication, and presentation. Also, they are known as Web Content Management (WCM) network content management systems. All of these features help educators create new learning environments online.

The system was created by Martin Dougiamas, who was the administrator of WebCT at the Curtin University of Technology and was based on the pedagogical ideas of constructivism. The first version of the platform appeared on August 20, 2002, and new versions have been created regularly (Moodle official site).

Brightspace is an LMS platform developed by desire2learn software company, this learning platform focuses on the academic part of e-learning, which means schools and universities. Its service is offered from the cloud of the web, so it is not necessary to install any platform. It is certified with ISO 27000 which certifies information security.

Definition of teaching strategies

Didactics is defined as the technique used to manage, most efficiently and systematically, the teaching-learning process (De la Torre, 2005), the components that interact in the didactic act are:

- The teacher or professor.

- The learner or student body.

- The content or matter.

- The learning context.

- Methodological or didactic strategies.

The didactic strategies contemplate the learning strategies and the teaching strategies.

Methodology

The type of qualitative research is based on phenomenology, (Martínez, 1999), (Hernández, 2014) as a direct expression of the key informants, which allowed for describing, grouping, and interpreting the findings in the adaptation process of a disruptive moment in the teaching-learning process. The research procedure was based on the collection of information that leads to answering the study questions, aimed at identifying the teaching-learning strategies used by teachers and students of technological higher education. By the stated objective, the research was carried out under the interpretive paradigm (Cohen, L. and Manion, L. 1990) understood as a process where a set of hermeneutical experiences is carried out within the research context. The results reveal the strategies imposed in a period from March 2020 to January 2022.

In this investigation, the intentional sampling strategy was used and specifically in the sampling-based on criteria for the selection of informants, whose main predominance was: students enrolled in the January - June 2020 semester until the January June 2022 semester. Teachers teaching virtual classes from the January-June 2020 semester until the January-June 2022 semester. Acting directors in the January-June 2020 semester until the January-June 2022 semester.

To identify how they faced the situations of confinement and closure of schools with face-to-face classes, open interviews were conducted with 10 teachers who taught classes in the periods studied, with 120 students from the economic-administrative area, and with two acting directors in the same periods in the academic department.

Procedure for the collection and analysis of information

To answer the research questions, what problems in the teaching-learning process did the students, teachers and administrators face? What teaching strategies did the teachers apply when the school closed its doors due to the health contingency? What is the emotional situation found by teachers, students, and administrators? For which the three moments indicated by Martínez (1998) were assumed.

The first moment, of the initial description of the phenomenon to keep in a situational context.

In the second moment, interviews were applied where the key informants described the emotions they felt and the strategies they had to do to continue with the teaching-learning process in a disruptive context that contrasted with traditional strategies.

Finally, a conceptual synthesis was built that synthesizes and narrates the findings of the experiences in the adaptation process at an uncertain moment in the teaching-learning process.

Results

As a result of the descriptive process, that requires qualitative research under the phenomenological methodology, cited by Aguirre-García, J.C, and Jaramillo-Echeverri, L.G. July-December 2012, contributes to the knowledge of school realities, to the experiences of the actors in the training process, that tries to see things from the point of view of other people, describing, understanding and interpreting, aimed at answering the research question on what problems in the teaching-learning process did students, teachers and administrators face? What teaching strategies did the teachers apply when the school closed its doors due to the health contingency? What is the emotional situation found by teachers, students, and administrators?

The results are presented according to the expressions exposed in the interviews carried out with the key informants, for which extraction of content is made in categories: In table 1 it corresponds to the category of emotions that they felt in the process of confinement and closure of schools to take classes in person. In table 2. Strategies implemented by teachers, students to continue with the teaching-learning process, and table 3. Implemented technological tools.

Informants / descriptors
Students
- When starting the first semester of the degree, a feeling of joy.
- The pandemic arrives and i got scared, what is going to happen? Will classes continue?
- They inform me that the classes will be online, i got scared because i thought i was not going to learn.
- Fear for health.
- I thought i wasn't going to be ready to change my modality.
- The beginning was very difficult, i am not used to being in confinement.
- It took me about seven months to adapt to confinement.
- Have the mindset that everything is going to be okay.
- Lots of mood swings, which i'm working on improving.
- I feel like i'm making progress.
Teachers
- The beginning was not very stressful having taken virtual platform courses in semesters before the pandemic.
- I had a lot of problems adapting to teaching.
- I got COVID-19 with severe symptoms in may 2020.
- I had a period of 40 days of illness, including 10 days in the hospital.
- I had support from the authorities.
- It was stressful due to physical exhaustion, and inflammation that prevented me from sitting for a long time.
- I managed to complete all the elements of the platform which gave me a lot of security and peace of mind.
- So far i am very calm knowing that i manage the different platforms very well.
- Currently, there is great uncertainty that i live that there is no concrete program of how the return to classes will be, today we have news tomorrow. This creates confusion.
- If we are sick with COVID-19, the school has given us the support of having a space so as not to infect another classmate and have the time to stay home and recover. This gives us peace of mind.
- I had the aftermath of postcovid.
- Tiredness, inflammation in the joints.
Directors
- The work was more intense being at home, more hours were worked assisting teachers who had doubts, talking on the phone with each of the teachers,
- Teachers were asked how they were doing, what was the situation in the synchronous classes,
- Be available for more than twelve hours so that the teaching-learning process is not affected.
- At the end of the day, he felt more physical fatigue.

Table 1 Emotions, stress symptoms caused by confinement and school closures.
Source: Own elaboration

The Strategies that teachers and students implemented to continue with the teaching-learning process describe the different paths that students, teachers, and administrators had to take according to their knowledge and skills in the different digital platforms, as shown. in table 2.

Informants / descriptors
Students - Start taking classes online, teachers still do not know how to organize, they started with what they knew. - The strategies were as if they were face-to-face, solving doubts. - The teachers, each took a different path in the implementation of their actions in teaching their classes.
Teachers - I adapted quickly because i had previously taken some courses in digital tools. - I realized the great importance of having material on the platform to have certainty on the part of what the student is going to see with the teacher and the teacher to have a structure that allows him to qualify fairly and does not take him a lot of time. To evaluate the works, of the exams that are online. - Where it was not very good was that the brightspace platform began to be used on a mandatory basis and some teachers who did not have the skills to face these changes found it difficult to apply them in their classes. - I had the opportunity to direct the learning of other colleagues in the bright space platform.
Directors - Through the academy and the academic sub directorate, strategies are sought to serve students with the same quality and flexibility - Teachers are asked to be flexible and give feedback to students to follow up and avoid dropouts. - In the august-december 2020 period, teacher training was reinforced in the design and handling of materials for each of their subjects. - Small support groups were formed, where the teachers who had the greatest ability in the brightspace and teams platforms, guided and followed up a group of no more than 5 teachers, depending on the support their classmates needed. - A group of social service students was trained to support teachers who required more specific help to upload material and activities to the platforms, with excellent results with teachers who had deficiencies in technological skills. - In the august-december 2021 semester, there was already enough teaching material, with recorded classes, much more adapted to the distance modality, with a 6% failure rate - It was implemented that residences and social services were carried out as home offices. - The strategy of carrying out the qualification exams on the teams platform was proposed, having a well-defined process, where teachers who had greater skills in the platforms were invited to be synods.

Table 2 Strategies implemented by teachers and students to continue with the teaching-learning process.
Source: Author's Perception

Table 3 mentions the different technological tools implemented by the students, teachers, and administrators that they used in the teaching-learning process, considering their competence in tools to teach synchronous classes and content repositories for each subject.

Informants / descriptors
Students - Implemented the brightspace platform. - Programs in the (virtual) cloud. - Use of my phone. - Synchronous class platforms such as teams, zoom, and Webex.
Teachers - I had material from the subjects taught on the moddle platform and my students could access the resources and tasks. - The brightspace platform began to be used on a mandatory basis. - I followed another platform to follow the sessions in class, i combined the zoom platform with the brightspace platform. - The school has given us the facilities to develop the work. The brightspace platform had changed and those of us who were able to adapt had no problems, however, the teachers who did not have the skills to use the platform did have many problems managing the platform. - The institution has an entry filter system, where you can verify if any worker or student has symptoms of COVID-19, it indicates that they cannot enter the facilities. - It was hard for me to learn the platforms, and i'm still learning.
Directors - Workers are trained in virtual mode by an expert institution on the subject. - The management of the brightspace platform is instructed as a repository where students can access content, activities, and exams according to the topics programmed in the study plans of each subject. - An online learning platform, brightspace, was implemented, which allowed the transformation of a classroom into a platform with the contents of activities, exams, and academic resources. - Institutional emails are used - The webex and team's platform is used for synchronous classes.

Table 3 Technological tools implemented
Source: Author's Perception

Conclusions

Therefore, it can be affirmed that the pandemic and the closure of schools triggered states of stress, physical and emotional exhaustion, uncertainty, fear of getting sick in the teachers, some had consequences of the disease, such as extreme fatigue, inflammation, although the school provided support to the employees who got sick, colleagues who supported other colleagues in learning the platforms that the management provided for the management of the content, activities, and exams of the subjects on the Brightspace platform.

Synchronous classes were on Teams, Webex, and Zoom. Although the training was given in a general way, the technological capacities of the teachers were different and the application of the contents was not the same at the beginning, but as the semesters passed, the teachers became more skilled in the use of the platforms.

Various strategies were implemented to develop the content of the subjects on the Brightspace platform. These consisted of training groups of social service students to specifically support teachers who had a problem with uploading teaching resources, scheduling activities in subjects, and reporting attendees to synchronous classes in Teams or Webex. and in a general way to use the platform.

Small teams of no more than five members were also formed, guided by a teacher with greater technological skills, who advised the other members on the management of the Brightspace platform throughout the first semester of the pandemic.

Although the results presented are from an academic department, it denotes a reality lived in a period of confinement and closure of the technological in a new reality with the teaching-learning process, a study of greater scope is being worked on where other departments are addressed and a greater number of subjects to investigate.

References

Aguirre-García, J.C. y Jaramillo-Echeverri, L.G. (julio-diciembre, 2012) Aportes del método fenomenológico a la investigación educativa. *Revista Latinoamericana de Estudios Educativos (Colombia)* 8 (2) https://www.redalyc.org/articulo.oa?id=134129257004

Amon-Abad C. E., García-Herrera, D.G Erazo-Aalvaréz C.A. Erazo-Alvarez J.C. Teaching and Student Perspective on the use of the Esemtia virtual.*Revista interdisciplinarian de humanidades:Educación, ciencia y tecnología. platform*; 6 (6) No. 3 2020 https://www.cienciamatriarevista.org.ve/index.php/cm/article/view/402/535 DOI 10.35381/cm.v6i3.402

Brightspace.org in | D2L Plataforma de aprendizaje en línea | Creadores del software BRIGHTspace LMS https://www.d2l.com/es/

Cohen, L.y Manion, L. Métodos de investigación educativa. Madrid: Muralla, 1990.

De la Torre Zermeño, F. (2005) *12 lecciones de pedagogía, educación y didáctica*. México. Alfaomega.

Delgado Fernández, M. y Solano González A. (2009) Estrategias didácticas creativas en entornos virtuales para el aprendizaje. *Revista Electrónica Actualidades Investigativas en Educación*. 9(2) en: estrategias didácticas creativas en entornos virtuales para el aprendizaje. https://www.redalyc.org/articulo.oa?id=44713058027

Hernández, Sampieri, R., Fernández Collado, C. y Baptista Lucio, M. del P. (2014) *Metodología de la Investigación*. 6 ed. México. McGraw-Hill

Luna Ramírez, F.E., Albor Calderón, MG. y Groce Ortiz, A.T. (enero – junio 2021). El uso de las plataformas virtuales como apoyo para el trabajo académico en línea. *Revista Electrónica ANFEI digital.* https://anfei.mx/revista/index.php/revista/article/view/750/0

Martínez, M. (1999). *El comportamiento humano*. Caracas. Trillas.

Moodle Sistema de Gestión del Aprendizaje.org en https://moodle.org/?lang=es_mx

Portillo-Peñuelas, S.A. Castillanos.Pierra, L.I.; Reynoso-González, O.U. y Gavotto Nogales, O.I.(2020). Enseñanza remota de emergencia ante la pandemia COVID-19 en educación media superior y educación superior. Propósitos y Representaciones, 8 (SPE3), e589. Doi: http://dx.doi.org/10.20511/pyr2020.v8nSPE3.589.