La continuidad formativa del alumnado durante la pandemia

The training continuity students during the pandemic

Continuidade da formação dos alunos durante a pandemia

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Resumen

El objetivo de la investigación fue valorar la continuidad formativa del estudiantado de posgrado durante la pandemia por COVID-19, para determinar su incorporación y uso permanente en el retorno a la modalidad presencial. El enfoque metodológico fue cuantitativo, con alcance descriptivo. La información se recopiló mediante un cuestionario estructurado con una escala tipo Likert, abarcando las dimensiones de acceso y tipo de dispositivo, metodologías didácticas, recursos digitales usados y satisfacción estudiantil. Los resultados mostraron que las metodologías activas fomentan la colaboración entre pares y el uso de materiales didácticos digitales, lo cual promueve habilidades como el análisis, la argumentación, la síntesis y la evaluación en los estudiantes. Se encontraron diferencias

significativas respecto al género en la continuidad formativa basada en la enseñanza remota de emergencia (t = 4.365, p = 0.000); no hubo diferencias significativas para el empleo de metodologías activas (t = 0.167, p = 0.485). Se identificaron diferencias significativas por programa educativo en la continuidad formativa basada en la enseñanza remota (t = 4.811, p = 0.000) y en el uso de metodologías activas (t = 5.034, p = 0.000).

Palabras clave: estudiantado, metodologías activas, recursos digitales, valoración estudiantil.

Abstract

The objective of the research was to assess the training continuity of postgraduate students during the COVID-19 pandemic to determine its permanent incorporation and use upon returning to in-person learning. The methodological approach was quantitative with a descriptive scope. Information was collected using a structured questionnaire based on a Likert-type scale, covering dimensions such as access and type of device, teaching methodologies, digital resources used, and student satisfaction. The results showed that active methodologies promote peer collaboration and the use of digital teaching materials, enhancing students' skills in analyzing, arguing, synthesizing, and assessing. Significant differences were found regarding gender in training continuity based on emergency remote teaching (t = 4.365, p = 0.000); however, no significant differences were identified for gender in the use of active methodologies (t = 0.167, p = 0.485). Significant differences by educational program were found in training continuity based on emergency remote teaching (t = 4.811, p = 0.000) and in the use of active methodologies (t = 5.034, p = 0.000).

Keywords: students, active methodologies, digital resources, student assessment.

Resumo

O objetivo da pesquisa foi avaliar a continuidade educacional dos alunos de pós-graduação durante a pandemia da COVID-19, para determinar sua incorporação e utilização permanente no retorno à modalidade presencial. A abordagem metodológica foi quantitativa, com escopo descritivo. As informações foram coletadas por meio de questionário estruturado com escala do tipo Likert, abrangendo as dimensões acesso e tipo de dispositivo, metodologias de ensino, recursos digitais utilizados e satisfação dos alunos. Os resultados mostraram que as metodologias ativas estimulam a colaboração entre pares e o uso de materiais didáticos

Introduction

In the context of the COVID-19 pandemic, educational systems incorporated virtual platforms and digital tools to ensure the continuity of students' education remotely (Gervacio and Castillo, 2022). Martin and Furiv (2020) highlight that educational institutions promoted access to databases, technological resources, and adjusted academic calendars to continue the educational process. On the other hand, Wang et al. (2020) point out that students had to abruptly adapt to distance education, altering their non-academic activities, which impacted their performance. The lack of connectivity and technological skills aggravated this situation, affecting the continuity of studies and, in some cases, causing students to drop out of school.

In this sense, and based on what was indicated by Ellis et al. (2020), Bubb and Jones (2020), during confinement, training practices based on active methodologies with technological support by teachers have been introduced that promote both autonomous learning, self-regulation and collaborative work among students. It is relevant to investigate their effectiveness in their training process.

Based on the above, the postgraduate program had the challenge of continuing to serve students during confinement with the aim of providing quality academic training, so it faced the challenge of designing and implementing active teaching methodologies aimed at promoting learning practices that develop knowledge, skills, abilities and attitudes for professional training, research, collaborative work and the use of digital tools in students so that when they graduate they are able to formulate solution proposals to the various problems of the labor sector.

Previous literature

The incorporation of ICTs in education has transformed training practices, facilitating flexible learning environments where students can be the protagonists of their training (Cruz and Zorrilla, 2021). In the context of postgraduate studies, these tools are essential to develop skills that allow students to face work challenges (Lam and Mckercher, 2013). During the pandemic, educational institutions adapted their training processes to virtual modalities, using digital platforms, forums and video conferences that promoted participation and autonomous learning (López and Contreras, 2022).

Postgraduate studies are the educational level responsible for generating high-level human talent that allows us to face the various problems of the work environment. In this sense, it is important for any organization that its human capital has a set of skills that allow them to identify and analyze the main situations, problems and trends that enable their development and positioning, so that they are in a position to make reasoned business decisions (Lam and Mckercher, 2013).

Under the context of the crisis caused by the COVID-19 pandemic, which led to the implementation of social distancing and confinement measures established by health authorities, educational institutions had to adapt face-to-face courses to the virtual modality based on the management of applications and management systems, as well as the transition of student training and administrative processes (López and Contreras, 2022).

Given the above, virtual spaces became the center of academic training for students through the incorporation of communication tools and platforms where the exchange of information, content, videos, conferences, magazine articles and books, mainly, is possible. In addition, in the midst of the pandemic, virtual presence is inaugurated, from which school and academic meetings are held, giving rise to the beginning of novel and disruptive practices that are relevant to analyze to determine their effect on the quality of student learning (Fornasari, 2020).

In this sense, access to and use of educational platforms and digital tools such as forums, chats, video conferences and journal databases promote participation and autonomous construction of learning in students (Briceño-Pira et al., 2019). Likewise, the incorporation of active methodologies based on ICTs was necessary to continue student learning after the emergence of the COVID-19 pandemic (Norman-Acevedo and Daza-Orozco, 2020).

According to Bravo et al. (2020), active methodologies are characterized by being oriented towards promoting learning and not teaching; activities are based on real situations; quality is prioritized over quantity; students self-regulate and take responsibility for their learning, as well as participation, cooperation and teamwork are prioritized. Therefore, these methodologies consider that learning is a more constructive than receptive process, so in order to guarantee its quality, the design and implementation of practical activities focused on students assimilating the contents in situations contextualized to the work environment in which they work is relevant (Lupión and Caracuel, 2021).

Among the main active methodologies are Project-Based Learning (PBL) and the Flipped Classroom (FL). The first one encourages the research process by carrying out a project based on a real case that enables the application of theory with practice, generating not only intellectual but also social development that will allow better professional training (Paños, 2017). In this sense, it focuses on the relevant elements of the subject, a topic susceptible to being developed through a project is selected, which constitutes a challenge related to a real problem, so that during its realization the communication and collaborative work of the participants is necessary (Fajardo, 2019). The second one aims to encourage student motivation through collaboration during their training process with a better allocation of time. Thus, it establishes that face-to-face sessions do not focus on explanations by teachers, but rather are oriented towards learning experiences based on solving activities collaboratively (Van Sickle, 2016).

Both active methodologies provide initial training before class through various educational materials such as the use of videos, content notes, textbook readings or journal articles; while class time is dedicated to solving situations or projects, under the mediation of the teaching staff (Schroeder and Dorn, 2016). In addition to the student being an active protagonist of their learning, learning is social and meaningful. Learning needs to be realistic, feasible and complex so that the student finds relevance in the transfer of said content. (Curipoma et al., 2023)

Cabero and Llorente (2020) indicated that the pandemic transformed face-to-face teaching in higher education towards a technology-mediated model. Therefore, if the following elements are met: the online training activities are consistent with both the methodology and the content; these are adapted to be taught with digital tools; the teaching staff has adequate training and the students have the knowledge, skills and attitudes to

continue through distance education, the learning outcomes do not have to differ from the face-to-face modality (OEI, 2020).

As a result of the approach of Castilla, Durán and Ortíz (2021), they establish that the elements of a course in remote teaching are: Initial presentation such as videos and PowerPoint presentations; support material (readings of articles, books or videos by teachers); learning activities aimed at the application of the content and evaluation instruments aimed at assessing the level of achievement of the students' skills. Likewise, given the conditions of the pandemic, it was imperative to incorporate active methodologies that would generate the combination of autonomous, participatory and collaborative work in synchronous and asynchronous scenarios that would allow optimizing the resources of online teaching support (Harvey and Bilbao, 2022).

For its part, IESALC (2020) mentions that the appearance of the coronavirus in the educational system has to be addressed as an area of opportunity that allows the incorporation of a renewed teaching and learning model. Similarly, Murillo and Duk (2020) emphasize that the impact generated by the closure of schools and other social restrictions in countries has influenced the development of distance education research in order to obtain and systematize useful information on training practices that are likely to continue being used in person when the health emergency ends. Meanwhile, Carrillo et al. (2020) establish that the incorporation of ICT has proven to be an effective tool that promotes the teaching-learning process remotely by increasing the effectiveness of teaching through various digital teaching resources in addition to the use of synchronous and asynchronous activities, especially in scenarios generated by natural disasters or pandemics.

Thus, the impacts of the COVID-19 pandemic on education are a relevant topic that deserves to be analyzed from the perspective of its actors (Miguel, 2020). Thus, in the study carried out by ECLAC-UNESCO (2020), they identified that neither curricular adjustments nor adaptations were carried out to ensure the relevance of the content to the emergency remote teaching context. It also points out that due to the lack of experience of teachers in virtual environments, it resulted in excessive transfer of information to students by email or organized in a digital repository.

While Maile et al. (2020), Ewing and Cooper (2021), and Ryan (2021) establish that due to the limited experience of teachers in virtuality, there was little communication with students, a learning environment with little affect and low motivation, coupled with poor interaction between the various educational actors. Similarly, Cano et al. (2020); Burgos et

al. (2021) point out the existence of difficulties related to academic monitoring and evaluation used with students, where teachers recognize that the design of both the activities and the teaching resources for a virtual environment require a greater investment of time, which results in a lack of evaluation instruments. They also indicate that due to teachers' lack of knowledge of technological tools, it led to a decrease in interaction with their students and caused academic monitoring to not be permanent.

Research method

Objective of the study

Evaluate the educational continuity of postgraduate students during the COVID-19 pandemic to determine their incorporation and permanent use for the return to the face-to-face modality.

Type of research

The methodological approach used was quantitative with a descriptive scope whose main objective is to determine the main characteristics of the academic training of postgraduate students during the confinement caused by the COVID-19 pandemic.

Hypothesis

The hypothesis of the study is: During the COVID-19 pandemic, graduate students continuously incorporated and used active methodologies in their training.

Participants

The participants were students studying a postgraduate degree in administration at the National Polytechnic Institute, with a total of 73 distributed among the following programs: Master of Science in Business Administration (MBA) and Master of Sustainable Business Administration (MSBA). Therefore, a non-probabilistic sample was used. The main characteristics of the participants are shown in Table 1.

Table 1. Participants

Variable		*n*	%
Gender	Female	48	65.8
	Male	25	34.2
Age	25 to 29	11	15.1
	30 to 34	38	52.1
	35 to 39	24	32.8
Program	MBA	46	63.0
	MSBA	27	37.0

Source: Own elaboration

Based on Table 1, it is identified that the highest participation by gender corresponds to women with 65.8%, while for age it is with the interval between 30 and 34 years with 52.1% and for the postgraduate program, the MBA program stands out with 63.0%.

Instrument

The instrument used consisted of a structured questionnaire with the dimensions: 1) participant data, 2) technological characteristics (technological device, time and access) and, 3) student satisfaction and active methodologies with items that were measured through a scale from 1 (totally disagree) to 5 (totally agree).

The questionnaire designed in its initial version was tested for content validity using the expert judgment technique for its analysis in the aspects of clarity, congruence and bias of the items, which allowed the necessary adjustments to be made to prepare the final version of the instrument (Corral, 2009; Ruíz, 2014). Then, the Cronbach alpha coefficient was calculated to measure its reliability, giving a value of 0.897, interpreted as a good reliability index for the magnitude and for the relevant elements of the research (George and Mallery, 2011).

The application of the instrument was carried out by email to each of the participants, mentioning the objective and importance of the research in addition to guaranteeing confidentiality.

Data analysis

The collected data were organized into frequency distributions (absolute and relative) and descriptive statistics such as mean (M) and standard deviation (SD) were calculated. Subsequently, the *KS test was performed* to verify the normality of the data and *t test* with significance level (*p*) = 0.05.

Results

The first findings obtained correspond to the technological characteristics of the participants (Table 2).

Table 2. Technological characteristics of the participants

Category		*n*	*%*
Main technological device	Computer	25	34.2
	Laptop	40	65.8
	Cellular	8	10.9
Time of use per day during confinement (hours)	One	5	6.8
	Two	15	20.5
	Three or more	53	72.7
Internet access (connection)	Fixed	63	86.3
	Mobile	10	13.7

Source: Own elaboration

Table 2 shows that the main technological device used by participants was the laptop (65.8%), while 72.7% spent three or more hours a day on online activities during confinement. In addition, 86.3% of participants had a fixed internet connection.

Regarding the situations faced by students during the COVID-19 pandemic, the following were found: 90% of the situations were logistical (organization and distribution of time for work, family and academic activities); 74% were socio-emotional (manifestation of sadness, frustration, anxiety and lack of motivation); while 52% were educational (complying in a timely manner with the completion and submission of academic activities remotely).

student satisfaction at the graduate level are organized in Table 3.

Table 3. Assessments on emergency remote teaching

Emergency Remote Teaching made it possible	M	SD
Adapt the subject's work plan	4.85	0.14
Adapt the thematic content for training continuity	4.72	0.19
Achieve the objectives of each subject	4.81	0.16
Use active methodologies mediated by digital tools	4.68	0.21
Recognize the usefulness of digital teaching resources for academic training	4.52	0.32
Academic flexibility that respects learning styles	4.77	0.19
Permanent access and use of digital tools	4.74	0.24
A responsibility for my academic training	4.63	0.32
Interact with faculty to review my academic progress	4.76	0.23
Recognize that the training received is of quality	4.79	0.21

Source: Own elaboration

As seen in Table 3, participants positively valued the emergency remote teaching at the postgraduate level, highlighting the adaptation of the work plan (M = 4.85, SD = 0.14), the scope of the objectives of each subject (M = 4.81, SD = 0.16), and the perceived quality of training (M = 4.79, SD = 0.21).

This was possible due to the existence of academic flexibility that considers learning styles (4.77 ±0.19) in connection with the interaction with the teaching staff focused on monitoring academic training (4.76 ±0.23). In addition, the possibility of continuing with the training continuity during the COVID-19 pandemic was possible due to the access and use of the various digital tools (4.74 ±0.24) together with the adaptation that was carried out in the contents of each subject (4.72 ±0.19).

Regarding the incorporation of active methodologies such as PBL and AI, the results are shown in Table 4.

Table 4. Perception of active methodologies during confinement

The active methodologies used during confinement allowed	M	SD
The opportunity to collaborate with classmates (asynchronous and synchronous)	4.94	0.12
Review digital teaching resources such as videos, scientific articles and presentations in advance	4.89	0.15
Learning better with digital teaching resources	4.82	0.28
Increase motivation to learn	4.77	0.24
Analyze, argue, synthesize and evaluate practical situations	4.87	0.18
Propose solution strategies	4.83	0.23

Source: Own elaboration

The results in Table 4 reveal that active methodologies mainly encouraged collaboration between peers (M = 4.94, SD = 0.12) and the use of digital teaching materials for participation in virtual sessions (M = 4.89, SD = 0.15). This contributed to the development of analytical skills and the ability to propose practical solutions (M = 4.83, SD = 0.23). Thus, the relevance of the use of digital teaching resources used during the training continuity (4.82 ±0.28) is confirmed, which also encourages motivation for learning (4.77 ±0.24).

KS test was carried out in order to identify whether the data distribution is normal. It was found that the test statistic Z = 0.835 with *p* = 0.545. This indicates that normality is met, so the parametric Student *t test is used.*

Table 5. *t*- test results for gender

Gender	Emergency remote teaching	(t)	p	Active methodologies	(t)	p
	M			M		
Female	4.86	4.365	0.000	4.98	0.167	0.485
Male	4.60			4.71		

Source: Own elaboration

The results of the t-test (Table 5) indicate significant differences in the assessment of emergency remote teaching by gender (t = 4.365, p = 0.000), with a higher score by women (M = 4.86). However, no significant differences were found in the assessment of active methodologies (t = 0.167, p = 0.485). On the other hand, the t-test by educational program (Table 6) shows significant differences in both variables, with higher ratings in the MAES program.

Table 6. *t*- test results by educational program

Educational program	Emergency remote teaching	(t)	p	Active methodologies	(t)	p
	M			M		
MBA	4.35	4.811	0.000	4.25	5.034	0.000
MSBA	4.88			4.82		

Source: Own elaboration

Discussion

From the results obtained, it can be deduced that the incorporation of ICTs in learning environments other than the classroom allows students to be protagonists and responsible for their learning process. Likewise, it is confirmed that the adaptation of the classroom modality to emergency remote teaching, as occurred in the IPN, incorporates work and collaboration spaces in virtual form, as well as both synchronous and asynchronous communication and even collections of newspaper and bibliographic resources.

The above allowed the generation of virtual spaces as academic training centers for students at the postgraduate level where content, videos, journal articles and books were exchanged, which led to a greater approach and interaction with the students, which motivated not only the adaptation of each subject to the online modality, the achievement of the objectives of each course and the use of various digital tools, the incorporation of active methodologies that made it possible to continue with the training continuity, which together allowed for quality learning for students.

In this sense, it is worth highlighting the relevance of using active methodologies to prioritize student participation in contextualized situations to promote teamwork, creativity, autonomy and exchange of strategies, as well as responsibility and self-regulation during the training process, as indicated by the graduate participants. In addition, synchronous and asynchronous communication was encouraged, which made support possible. The use of active strategies in the virtual classroom, according to Barrionuevo (2023), requires a great deal of planning and communication work between the teaching team, where each learning action is carried out taking into account the characteristics of the student being trained and in coherence with the expected learning outcomes. These aspects are taken into account when designing the learning experience, as well as the skills of the future professional.

Likewise, it is confirmed that support materials such as books, articles, books, etc. were used during the training continuity. Any material used promoted the experience of meaningful learning. This confirms what Ojeda et al. (2020) stated, that the results of this process are influenced by the level of digital skills that each student has, as well as the perception they have of their usefulness as a pedagogical mediation tool.

It is also confirmed that the ubiquity of ICT has influenced educational practices, which for this study correspond to the postgraduate level, where it has driven a transformation both in the ways of interacting and socializing and in providing academic services to students during confinement. It is known that it was immediate to transform face-to-face programs

into virtual programs in record time, which involved the development of skills in teachers to build the content in such a way that the development of the competencies proposed in the programs was achieved. (Ojeda et al., 2020)

On the contrary, there are points of view contrary to the previous approaches, regarding the absence of curricular adjustments and adaptations with the intention of continuing the academic training of students because at the postgraduate level they were carried out as mentioned by the participants of the study. Similar studies carried out by Chacín, Paredes & González (2020) confirm that higher education dynamized the educational practices of teachers, researchers, students and support staff, facing reality, the gaps: 1) resistance to change from the face-to-face classroom to that mediated by the use of technology 2) knowledge and use of synchronous processes, and 3) the increased use of digital technologies.

Similarly, with regard to the advantages of emergency remote education, the academic monitoring of postgraduate students was recognized by the participants of this study as being carried out on an ongoing basis and even allowing the objectives of each course to be achieved.

Based on the above, it is confirmed that the postgraduate course continues to fulfill, in the case of the IPN, the training of high-level human capital that is capable of facing the various organizational problems through intervention strategies. Therefore , the presence of the coronavirus in the educational system, specifically in the IPN, is important to be addressed as an area of opportunity that allows the incorporation of a renewed model of teaching and learning. It is possible to think that, if we do not transform the way we look at the students and the learning experiences that we seek to generate or should facilitate, we will remain for some time with teaching models that are poorly suited to the new needs until another pandemic shows us again that there are changes that are necessary in terms of university educational practices. (Moran and Manolaski, 2021)

Therefore, this research provides useful information from the students' perspective regarding the practices used during confinement to determine their effectiveness and feasibility of being incorporated for the face-to-face modality. Likewise, it is confirmed that carrying out research on the effectiveness of the active methodologies incorporated during confinement provides the possibility to continue with the academic training of students and teacher updating.

Conclusions

The health emergency caused by the pandemic led to the incorporation of strategies mediated by virtual tools as an adaptive response to continue the academic training of students. Under this scenario, the use of active methodologies, the high responsibility and openness of educational actors made it easier for the educational service to not be interrupted for the achievement and completion of school years. Likewise, a learning process based on active participation, intercommunication, collaborative work and even time management was favored, which had a positive influence among educational actors.

It is stated that the general objective of the study was achieved by providing relevant findings on the educational continuity of postgraduate students during the COVID-19 pandemic, providing relevant information on the actions aimed at academic training and monitoring of student learning at the postgraduate level that allow their continuous incorporation when the face-to-face modality returns after the pandemic. In this sense, the Virtual Academic Continuity Plan implemented by the IPN has worked at the postgraduate level because the student assessment has been positive, highlighting strengths such as the incorporation and continuous use of active methodologies based on digital resources, the usefulness of technological tools, as well as interaction with the teaching staff to review the academic progress of the students. In this way, the hypothesis of the study was verified by recognizing the existence of significant differences with respect to gender for educational continuity and by educational program.

It is therefore recommended that educational practices, methodologies, strategies and digital resources that enabled academic continuity be integrated into the return to in-person learning.

However, the main limitations of the research carried out are the sample size, since it is focused on students from the same educational institution and area of knowledge.

Future lines of research

It is suggested that, in order to give continuity to the research, the sample or population be expanded, as well as comparative studies of the specialties within the same postgraduate course. It is also proposed to use the qualitative approach in order to collect the testimonies of the participants (teachers and managers) regarding their experience in the training process.

It is also suggested to conduct research on the use of active methodologies for the acquisition of competencies by higher education students. Also, to determine student satisfaction with respect to the usefulness and relevance of virtual databases in academic training. To find out which methodologies and technological tools used virtually are currently used in the virtual modality and the impact on academic performance.

Furthermore, it is important to conduct studies on the effectiveness of active methodologies in developing research skills in postgraduate students, as well as determining the development of digital skills.

It will be of utmost importance to investigate: Access to technological tools affected groups of students with different abilities or at a socioeconomic disadvantage, teacher training to continue the integration of emerging technological tools: Artificial intelligence, augmented reality, among others, in higher education and the impact, not only academic, but also in management, policies and administration as a result of virtual education.

References

Álvarez, V. Herrejón, V., Morelos, M. y Rubio, M. (2010). Trabajo por proyectos: aprendizaje con sentido. *Revista Iberoamericana de Educación*, *52*(5), 1-13. https://doi.org/10.35362/rie5251775

Briceño-Pira, I., Flórez-Romero, R. y Gómez-Muñoz, D. (2019). Usos de las TIC en preescolar: hacia la integración curricular. *Panorama, 13*(24), 21-32. http://dx.doi.org/10.15765/pnrm.v13i24.1203

Bravo, E., Costillo, E., Bravo, J. y Borrachero, A. (2020). Emociones de los futuros maestros de educación infantil en las distintas áreas del currículo. Profesorado. *Revista de Currículum y Formación del Profesorado, 24*(1), 96-114. https://doi.org/10.30827/profesorado.v24i1.8846

Bubb, S., y Jones, M. (2020). Learning from the COVID-19 home-schooling experience: Listening to pupils, parents/careers, and teachers. *Improving schools, 23*(3), 209-222. https://doi.org/10.1177%2F1365480220958797

Burgos, C., Vázquez-Cano, E., López-Meneses, E. y Adaos, R. (2020). DIFPRORET PROJET: Analysis of educational difficulties, proposals and challenges facing the COVID-19. *IJERI: International Journal of Educational Research and Innovation, 15*, 17-34. https://doi.org/10.46661/ijeri.5145

Cabero, J. y Llorente, C. (2020). Covid-19: transformación radical de la digitalización en las instituciones universitarias. *Campus Virtuales, 9*(2), 25-34. http://www.uajournals.com/ojs/index.php/campusvirtuales/article/view/713

Cano, S., Collazos, C., Flórez-Aristizabal, l., Moreira, F. y Ramírez, M. (2020). Experiencia del aprendizaje de la Educación Superior ante los cambios a nivel mundial a causa del Covid-19.*Campus Virtuales, 9*(2), 51-59. http://uajournals.com/ojs/index.php/campusvirtuales/article/view/734

Carrillo, C., Aragón, E. y Navas, A. (2020). Use and abuse of psychoactive substance use in university students at Covid-19 time. *Bulletin Magazine Redipe, 9*(8), 221-230. https://doi.org/10.36260/rbr.v9i8.1055

Castilla, G, Durán, A. y Ortiz, J. (2021). Reuse of components between virtual, b-learning, and face-to-face courses. A case study in Management Information Systems. *Aula Abierta*, *50*(1), 465-470. https://doi.org/10.17811/rifie.50.1.2021.465-470

Chacín, A. J. P., González, A. I. y Peñaloza, D. W. (2020). Educación superior e investigación en Latinoamérica: Transición al uso de tecnologías digitales por Covid-19. *Revista de Ciencias Sociales*, *26*(3), 98-117.

Comisión Económica para América Latina y el Caribe (CEPAL-UNESCO, 2020). *La educación en tiempos de la pandemia de COVID-19*. https://repositorio.cepal.org/handle/11362/45904

Corral, Y. (2009). Validez y confiabilidad de los instrumentos de investigación para la recolección de datos. *Revista Ciencias de la Educación, 19*(33), 229-247. http://servicio.bc.uc.edu.ve/educacion/revista/n33/art12.pdf

Cruz, C. y Zorrila, M. (2021). Prácticas digitales de estudiantes universitarios hondureños: Estudio de caso. *Revista Interuniversitaria de Formación del Profesorado, 96*(35), 103-120. https://doi.org/10.47553/rifop.v97i35.2.88189

Curipoma, C. N. G., Ocampo, M. E. N., Cajilima, D. P. C. y Peralta, S. R. T. (2023). Metodologías activas en el proceso de enseñanza-aprendizaje: implicaciones y beneficios. *Ciencia Latina Revista Científica Multidisciplinar*, *7*(3), 3311-3327.

Ellis, V., Steadman, S. y Mao, Q. (2020). Come to a screeching halt': Can change in teacher education during the COVID-19 pandemic be seen as innovation? *European Journal of Teacher Education, 43*(4), 559-572. https://doi.org/10.1080/02619768.2020.1821186

Ewing, L. y Cooper, H. (2021). Technology-enabled remote learning during Covid-19: perspectives of Australian teachers, students, and parents. *Technology, Pedagogy and Education, 30*(1), 41-57. https://doi.org/10.1080/1475939X.2020.1868562

Fajardo, E. y Gil, B. (2019). El aprendizaje basado en proyectos y su relación con el desarrollo de competencias asociadas al trabajo colaborativo. *Revista Amauta, 17*(33), 103-117. http://dx.doi.org/10.15648/am.33.2019.8

Fornasari, M. (2020). La pandemia en contextos educativos: Un enfoque ético sobre los tiempos virtuales y el porvenir. *Trayectorias, 23*(52), 3-15. http://trayectorias.uanl.mx/52/index.htm

George, D. y Mallery, P. (2011) *SPSS for Windows Step by Step: A simple guide and reference*. Allyn y Bacon.

Gervacio, H. y Castillo, B. (2022). Impactos socioemocionales, estrategias y retos docentes en el nivel medio superior durante el confinamiento por COVID-19. *RIDE Revista Iberoamericana para la Investigación y el Desarrollo Educativo, 12*(24), 1-31. https://doi.org/10.23913/ride.v12i24.1133

Harvey, J. y Bilbao, E. (2022). Las rutas de mediación virtual, experiencia e-learnging del modelo de aula invertida en tiempos de pandemia. *Panorama, 16*(30), 1-17. https://doi.org/10.15765/pnrm.v16i30.3071

Lam, C. y McKercher, B. (2013). The tourism data gap: The utility of official tourism information for the hospitality and tourism industry. *Tourism Management Perspectives, 6*, 82-94. https://doi.org/10.1016/j.tmp.2012.12.003

López, M. y Contreras, A. (2022). El impacto de la pandemia por COVID-19 en estudiantes mexicanos de educación media superior. *RIDE Revista Iberoamericana para la Investigación y el Desarrollo Educativo, 12*(24), 1-27. https://doi.org/10.23913/ride.v12i24.1141

Lupión, T. y Caracuel, M. (2021). Competencias profesionales de futuros docentes de educación secundaria. Estudio de caso de la evaluación formativa promovida mediante e-rubricas en la especialidad de física y química. *Profesorado. Revista de Currículum y Formación del Profesorado*, 25(1), 197-221. https://doi.org/10.30827/profesorado.v25i1.8374

Maile, R., Mena, J. y Feinauer, E. (2020). Faculty readiness for online crisis teaching transitioning to online teaching during the COVID-19 pandemic. *European Journal*

of Teacher Education, *43*(4), 523-541.
https://doi.org/10.1080/02619768.2020.1815702

Martin, M. y Furiv, U. (2020). *COVID-19 shows the need to make learning more flexible*. University World News. The Global Window on Higher Education, 28 marzo. https://www.universityworldnews.com/post.php?story=20200324115802272

Miguel, J. (2020). La educación superior en tiempos de pandemia: una visión desde dentro del proceso formativo. *Revista Latinoamericana de Estudios Educativos, 50*, 13-40. https://doi.org/10.48102/rlee.2020.50.ESPECIAL.95

Morán, L., Álvarez, G. y Manolakis, L. (2021). Experiencias de aprendizaje estudiantil en la pandemia. Un análisis acerca de la sincronía y asincronía en la formación universitaria. *Virtualidad, Educación y Ciencia*, *13*(24), 49-71.

Murillo, J. y Duk, C. (2020). El Covid-19 y las Brechas Educativas. *Revista latinoamericana de educación inclusiva, 14*(1), 11-13. https://dx.doi.org/10.4067/S0718-73782020000100011

Norman-Acevedo, E. y Daza-Orozco, C. (2020). Construcción de contenidos para la enseñanza virtual: retos coyunturales en el confinamiento. *Revista Panorama, 14*(27), 32-44. https://doi.org/10.15765/pnrm.v14i27.1517

Ojeda-Beltrán, A., Ortega-Álvarez, D. D. y Boom-Carcamo, E. A. (2020). Análisis de la percepción de estudiantes presenciales acerca de clases virtuales como respuesta a la crisis del Covid-19. *Espacios*, *41*(42), 81-92.

Organización de Estados Iberoamericanos para la Educación, la Ciencia y la Cultura (OEI, 2020). *Efectos de la crisis del coronavirus en la educación*. https://oei.int/oficinas/secretaria-general

Paños, J. (2017). Educación emprendedora y metodologías activas para su fomento. *Revista Electrónica Interuniversitaria de Formación del Profesorado, 20*(3), 33-48. https://doi.org/10.6018/reifop.20.3.272221

Ruíz, A. (2014). *La operacionalización de elementos teóricos al proceso de medida*. Universitat de Barcelona. http://diposit.ub.edu/dspace/handle/2445/53152

Ryan, T. (2021). Designing video feedback to support the socioemotional aspects of online learning. *Educational Technology Research and Development, 69*, 137–140. https://doi.org/10.1007/s11423-020-09918-7

Suárez, N. y Custodio, J. (2014). Evolución de las tecnologías de información y comunicación en el proceso de enseñanza-aprendizaje. *Revista Vínculos, 11*(1), 209-220. https://doi.org/10.14483/2322939X.8028

Schroeder, L. y Dorn, B. (2016). Enabling and integrating online formative assessment in a flipped calculus course. *PRIMUS, 26*(6), 585-602. https://doi.org/10.1080/10511970.2015.1050619

Van Sickle, J. (2016). Discrepancies between student perception and achievement of learning outcomes in a flipped classroom. *Journal of the Scholarship of Teaching and Learning, 16*(2), 29-38. https://doi.org/10.14434/josotl.v16i2.19216

Wang, G., Cheng, Z., Yue, X. y McAleer, M. (2020). Risk Management of COVID-19 by Universities in China. *Journal of Risk and Financial Management, 13*(2), 36. https://doi.org/10.3390/jrfm13020036

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