Educación superior, innovación y docencia: alcances y limitaciones de la virtualidad como estrategia institucional

Higher Education, Innovation and Teaching: Scope and Limitations of Virtuality as an institutional strategy

Ensino superior, inovação e ensino: alcance e limitações da virtualidade como estratégia institucional

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Resumen

Este texto presenta los resultados de una indagación en una institución de educación superior en la que, a partir del año 2015, bajo la intención de mejorar los indicadores de calidad educativa, y en especial los de cobertura, se sustituyeron horas de clases presenciales por el empleo de una plataforma virtual en las asignaturas de todos sus programas de estudio. El objetivo que atiende este análisis se orienta a analizar las limitaciones que, desde la perspectiva del profesorado, caracterizan la enseñanza a través de tecnologías en una universidad pública estatal de México. Esto a través de un diseño cualitativo, un enfoque fenomenológico y la aplicación de una entrevista semiestructurada a 32 docentes adscritos a la institución. Los resultados ponen en evidencia principalmente tres situaciones: la sensación de incertidumbre respecto al uso de la plataforma virtual, el aparente desinterés por

implementar nuevas estrategias didácticas y la inquietud por un incentivo al ejercicio docente en la virtualidad. En consecuencia, se advierte la necesidad de promover el uso correcto de la plataforma virtual a través de programas de estímulos institucionales. Asimismo, se sugiere a la institución fomentar el desarrollo de estrategias didácticas acordes a los medios con los que dispone cada docente, ya que de no lograrse lo señalado será complicado asumir a la enseñanza a través de tecnologías como una innovación exitosa.

Palabras clave: enseñanza virtual, profesores, TIC.

Abstract

This text presents the results of an investigation in a higher education institution where, as of 2015, under the intention of improving educational quality indicators—and especially coverage—hours of face-to-face classes were replaced by the use of a virtual platform in the subjects of all its study programs. The objective of this analysis is aimed at analyzing the limitations that, from the teacher's perspective, characterize teaching through technology in a state public university in Mexico. This through a qualitative design, a phenomenological approach and the application of a semi-structured interview to 32 teachers attached to the institution. The results mainly reveal three situations: the feeling of uncertainty regarding the use of the virtual platform, the apparent lack of interest in implementing new didactic strategies and the concern for an incentive to teach in virtuality. Consequently, there is a need to promote the correct use of the virtual platform through the institutional stimulus program. Likewise, the institution is suggested to promote the development of didactic strategies according to the means available to each teacher, since if the aforementioned is not achieved, it will be difficult to assume teaching through technologies as a successful innovation.

Keywords: virtual learning, teachers, ICT.

Resumo

Este texto apresenta os resultados de uma investigação em uma instituição de ensino superior em que, a partir de 2015, com o intuito de melhorar os indicadores de qualidade educacional, e principalmente os indicadores de cobertura, a carga horária foi substituída pela utilização de plataforma virtual nas disciplinas de todos. seus programas de estudo. O objetivo desta análise é analisar as limitações que, na perspectiva do professor, caracterizam o ensino por meio da tecnologia em uma universidade pública estadual no México. Trata-se de um desenho qualitativo, de uma abordagem fenomenológica e da aplicação de uma entrevista semiestruturada a 32 professores vinculados à instituição. Os resultados revelam principalmente três situações: o sentimento de incerteza quanto ao uso da plataforma virtual, o aparente desinteresse em implementar novas estratégias didáticas e a preocupação com o incentivo ao ensino na virtualidade. Consequentemente, é necessário promover o uso correto da plataforma virtual por meio de programas de estímulo institucional. Da mesma forma, sugere-se que a instituição promova o desenvolvimento de estratégias didáticas de acordo com os meios à disposição de cada professor, uma vez que, se isso não for alcançado, será difícil assumir o ensino por meio das tecnologias como uma inovação de sucesso.

Palavras-chave: ensino virtual, professores, TIC.

Introduction

Since their inception, higher education institutions have offered professional training to individuals while their operation maintains a direct connection with the needs of society (Altbach, 2008). However, the demands and demands of society have always been heterogeneous and changing, in such a way that educational organizations have required to adapt over time through different strategies to make their offer relevant (Guzmán, Muñoz, Álvarez and Velázquez , 2009).

In this sense, and due to the effects of globalization, a significant challenge for higher education has been the incorporation of information and communication technologies (ICT), understood as means of support with the potential to contribute to diversification and improvement. of the teaching-learning processes. This has favored the configuration of new ways of offering education with the use of digital technologies (Ramírez and Casillas, 2014). Thus, universities have had the possibility of expanding access to information that is

produced globally, in addition to proposing new alternatives to face the problems (coverage and quality) of face-to-face education, specifically the issue of flexibility that training demands professional (Silvio, 2006).

In response to these intentions, since the late 1990s there has been a trend to virtualize higher education, which meant the implementation of digital technologies and resources in the teaching and learning methods of face-to-face education; also the reconfiguration of distance education as virtual education (Rama, 2012). According to Chan (2016), the virtualization of education demands an integration between physical and digital learning environments, considering that, between them, there is mediation of technologies for the representation or evocation of knowledge objects and the modeling of knowledge. interactions for learning.

This trend contributed to universities, in addition to investing in technological infrastructure, adhere to the intention of generating knowledge and skills in students to effectively use technologies in accessing and managing information (Organization for Cooperation and Development Economic [OECD], 2016). While some universities chose to acquire this type of resources, with the intention of reconfiguring the teaching practice, others implemented virtual education programs. In all cases, technologies have been implemented as part of the set of educational innovations suggested by various international organizations, with the assumption of improving the quality of teaching.

In this way, universities have moved towards a context, from an international perspective, where face-to-face education supported by technologies allows the possibility of generating positive and innovative changes in teaching (United Nations Educational, Scientific and Scientific Organization). Culture [Unesco], 2006). However, the achievements of technologies in education continue to seem doubtful and questionable because it is unknown, in general terms, how the teaching practice through the use of these has been favored, or if it has only been a simulation. Hence the relevance of investigating the subject from a qualitative perspective: exploring in greater depth the experience and perceptions of the actors, and therefore, going beyond the description of a set of indicators (Sautu, Boniolo, Dalle and Elbert, 2005).

Regarding the actors, it has been recognized that the role played by managers and teachers in the implementation of technologies for teaching is key to the conception of the objectives that are expected to be achieved. Institutions face the need to offer training to

teaching staff that allows them to use technologies favorably. For this, of course, they also require management personnel characterized by leadership and critical thinking to adequately promote this implementation (Ducoing, 2003; Hannan and Silver, 2005). Precisely, the problem of face-to-face education mediated by technologies is related to these approaches.

According to Allen and Gupta (2018), there is a simulated leadership that affects all institutions because managers limit themselves to repeating the speeches of the rectors' proposals or the guidelines established in institutional policies. Indeed, the lack of critical participation of the actors involved has a negative effect. In short, it is not enough to have the most modern means; It is also necessary to create a culture that encourages change in pedagogical mediations, overcoming teaching by exposure and learning by reception, along with the implementation of new paradigms of active and interactive learning. In addition, teacher training needs to enable teachers to understand how to harness technologies to positively transform classroom teaching. (Marcelo, 2013).

According to data from Silvio (2006), virtual education has increased since the arrival of the 21st century, since 10% of graduate students in Latin America in 2003 received classes in virtual education and 175 institutions had programs of virtual education for undergraduate and graduate. The benefits proposed by this type of modality were aimed at expanding coverage at a lower cost per student compared to traditional face-to-face education. However, from a curricular approach based on professional competencies, virtual education has not managed to form all the competencies that are proposed with equal quality. In addition, virtual education can mean the implementation of homogeneous models with low quality, extremely flexible and focused on teaching, without practices or mobility, and without systems for improving quality, relevance or intellectual reflexivity (Rama, 2012).

In this context, a different type of educational modality is ascribed, which implies activities typical of virtual education and the face-to-face format, but pedagogically structured to achieve the competencies / objectives; In addition to face-to-face sessions, it includes combining, integrating and complementing education with materials and technological resources. It presupposes the practical possibility of taking advantage of every didactically programmed occasion (course / module / subject) to mix techno-pedagogical methods (Turpo, 2012). This refers to the concept of blended education or b-learning, implemented in some institutions as a kind of prelude to the implementation of a virtual

education model and in others as a type of permanent modality that is the product of evolution in two different ways to offer education.

Generally, b-learning has been implemented in Mexico with the objective of combining the benefits of virtual education in terms of flexibility, coverage and reduction of costs per student with the virtues of face-to-face education: student-teacher interaction and feedback. It is a modality that, although it manages to regain the benefits of virtual and face-to-face education, it also seems to maintain some of the problems of both teaching modalities. Some investigations (Díaz-Barriga, 2020; Ruiz, 2020) have found that students perceive teaching better from a face-to-face modality as opposed to a blended one; Other approaches (Cobo, 2019; López, González and López, 2018) have recognized that teachers need better training to work with the use of technologies in teaching. So, could it be considered that the implementation of technologies in various educational modalities allows the innovation of teaching?

Educational innovation and the role of technologies in teaching

At a global level, universities have undergone different transformations. For more than three decades, one of the main problems was due to a massive and uncontrolled increase in the enrollment of students entering higher education, which caused instability and a generalized idea that the university did not respond to the demands of the society. Because of this, the institutions were stuck in internal political problems; to the need to raise quality and to continue raising enrollment (De Vries, 2005).

During those same years, the Mexican government also considered it necessary to extend coverage, in addition to placing emphasis on issues of educational quality, which led to the implementation of public policies in order to have a positive impact on the performance of its institutions. At the national level, educational change was promoted and institutionalized for the first time with the Program for Educational Modernization (1989-1994), which maintained the assumption of promoting the quality of educational programs through innovation and permanent evaluation of institutions. (Rubio, 2006).

Since then, the operation of higher education institutions has been regulated and influenced by various agencies and programs derived from public policy, which is translated as a set of plans, strategies and actions that seek to modify the system according to an explicit design of priorities and objectives. From the national context, the policies warn and

emphasize innovation as an axis to improve quality; However, as Rodríguez (2002) warns, when analyzing these policies it is necessary to go beyond the description of the government discourse, mainly because the system is integrated with public and private institutions that have their own autonomy.

Various international organizations have also proposed to achieve quality education and take advantage of the development of technological advances to increase coverage and offer better teaching (Unesco, 2016). Hence, educational institutions in Mexico are mainly aimed at optimizing indicators related to quality and coverage, without neglecting the recommendation to include technologies to innovate in their educational models. Thus, each establishment proposes innovations that can be very diverse, but that in each case aim at the institutional objectives and goals. This allows us to understand that educational innovation represents a process to generate actions with the intention of changing for the better, and whose results can be very varied.

The implications of each innovation, therefore, can be quite diverse depending on the context that it intends to modify and the actors that are involved in the change (Fullan and Stiegelbauer, 2011). This makes it pertinent to observe educational innovations as case studies, in order to identify institutional approaches, plans and objectives, and from this frame of reference recognize the results that are generated in the innovation, as well as possible focuses of attention when implementing change.

In Mexico, one of the most important events of change was the configuration of the higher education system that arose from the expansion of enrollment in the 1970s. This expansion was supported by a greater allocation of resources aimed at developing and creating new educational institutions, which allowed greater access to education for a growing and diverse population. However, this period was also characterized by an absence of policies that contributed to a positive impact on the quality of educational programs (Mungaray, Ocegueda, Moctezuma and Ocegueda, 2016), so that higher education in Mexico has been characterized by the date due to the heterogeneity and diversity of institutions (Rubio, 2006).

In 1978, a new type of institution was created in the subsystem of state public universities: state public universities with solidarity support (Upeas). It was not until 1994 when the creation of this type of institution was mainly promoted. The Upeas were created by decree of local congresses and under the legal figure of decentralized public bodies. They

receive a federal subsidy complementary to that granted by state governments, and they can establish their own tabulators and stimulus programs (Mendoza, 2015). They are aimed at developing functions of teaching, generation and innovative application of knowledge, as well as extension and dissemination of culture. However, due to the diversity of their educational models, offerings and institutional policies, the functioning of these institutions varies greatly from that of a university.

There are 25 institutions of this type that, together, offer professional training to 1.6% of Mexican students; of course, over time they have focused on increasing their coverage indicators. But, how is the operation of the Upeas? To what extent are their characteristics similar or different from those of other institutions? According to Mejía (2016), the information on this type of institutions is scarce, so he recommends inquiring about them, but analyzing particular cases, so that the results obtained can be compared with other institutions of this type.

In Sonora, one of the public institutions is the Sonora State University (UES). It was founded in 1983 after the efforts made by the state government to diversify enrollment (Rodríguez, Treviño and Urquidi, 2007) with the name of Centro de Estudios Superiores del Estado de Sonora (Cesues). It is a UPEA that is oriented to offer professional training to promote the priority areas of development in the region. Since its inception, this university has focused on increasing student enrollment and improving educational quality.

Also, by reviewing your background, you can detect various changes and a drive for innovation. The most outstanding is in relation to its student school population, since, although the institution was constantly increasing its enrollment, in the 2005-2006 school year the population was smaller compared to previous years. Around this, the institution has stated that the number of admitted students was limited by the lack of physical infrastructure, in addition to the insufficient results in terms of educational quality indicators (Espinosa, 2013).

To this institutional problems, the idea about study programs and their obsolescence was added, which led to the development of a project for the configuration of a new educational model called Enface, which was focused on student learning and on a system evaluation by competences; It also proposed to offer education supported by technologies - and especially the use of educational platforms - in alternative modalities to face-to-face for all programs and subjects. However, and despite the fact that the implementation of

technologies in teaching through the educational model of the UES is mentioned in the rector's reports as a case of success (Huerta, 2016), there are indicators that have not been improved, such as the student graduation rate (57%) or the terminal efficiency that from 2013 to 2016 decreased 20 percentage points. Although the objectives in terms of increasing coverage are achieved, those that have to do with educational quality seem to be pending.

In this sense, the objective of this text is oriented to analyze, from the teacher's perspective, the limitations of non-face-to-face teaching supported by technologies in a state public university in Mexico. This inquiry uses the theoretical perspective of educational innovation, since this allows us to recognize the influence that educational change can have on the actors. According to De la Torre (1998), in the task of describing an educational change through the development of an innovation, it is pertinent to recognize that transformations can be generated in different senses within the same context, since innovation has different approaches. Consequently, an analysis model is proposed that integrates such visions, which allows us to observe innovation as a process coupled with socio-political, technological and cultural factors that are related to the development of change and generate different conceptions in the actors involved.

Material and methods

It is a qualitative study that, from the perspective of the interpretive paradigm and through a phenomenological approach, investigates the experiences of a group of individuals about a phenomenon (Creswell, 2009). In this case: teaching through technologies and limitations from the teacher's perspective. The context of the research was the UES, an institution registered in the subsystem of state universities with solidarity support from the Mexican higher education system and located in the northwest of the country. The semi-structured interview was used as a technique for data collection, in order to identify new elements through the information provided by each informant.

With the intention of recovering information according to the contextual characteristics, an inquiry was carried out through an initial approach with teachers who had the opportunity to express ideas and problems about the topic of interest; later, it was contrasted with some theoretical contributions. For the instrument, the proposal of Cabero, Llorente and Puentes (2010) on blended training was used as an initial guide, with some

modifications depending on the institutional context and other contributions from the literature.

The final instrument consisted of 34 open questions aimed at addressing three aspects: 1) the techno-pedagogical approach, from which it is intended to address issues related to the conditions of the institution's technological infrastructure, 2) the teacher training provided by the institution, and 3) the conception about good practices through platforms and virtual spaces.

Another section was made up of cultural aspects and topics related to collaborative strategies, attitudes and beliefs of actors, in addition to the motivation they assume around teaching through technologies; Some of the authors who have allowed structuring this approach are Fink and Hargreaves (2006), Hannan and Silver (2005) and Fullan and Stiegelbauer (2011). For the dimension formed from the socio-political perspective, authors such as Brunner (2000), Cox (2002), Day (2013) allowed the configuration of a section that considers topics related to stimuli and incentives to participate in blended education; also on the commitment and leadership assumed by the actors in the modality (see figure 1).

Figura 1. Categorías iniciales de análisis
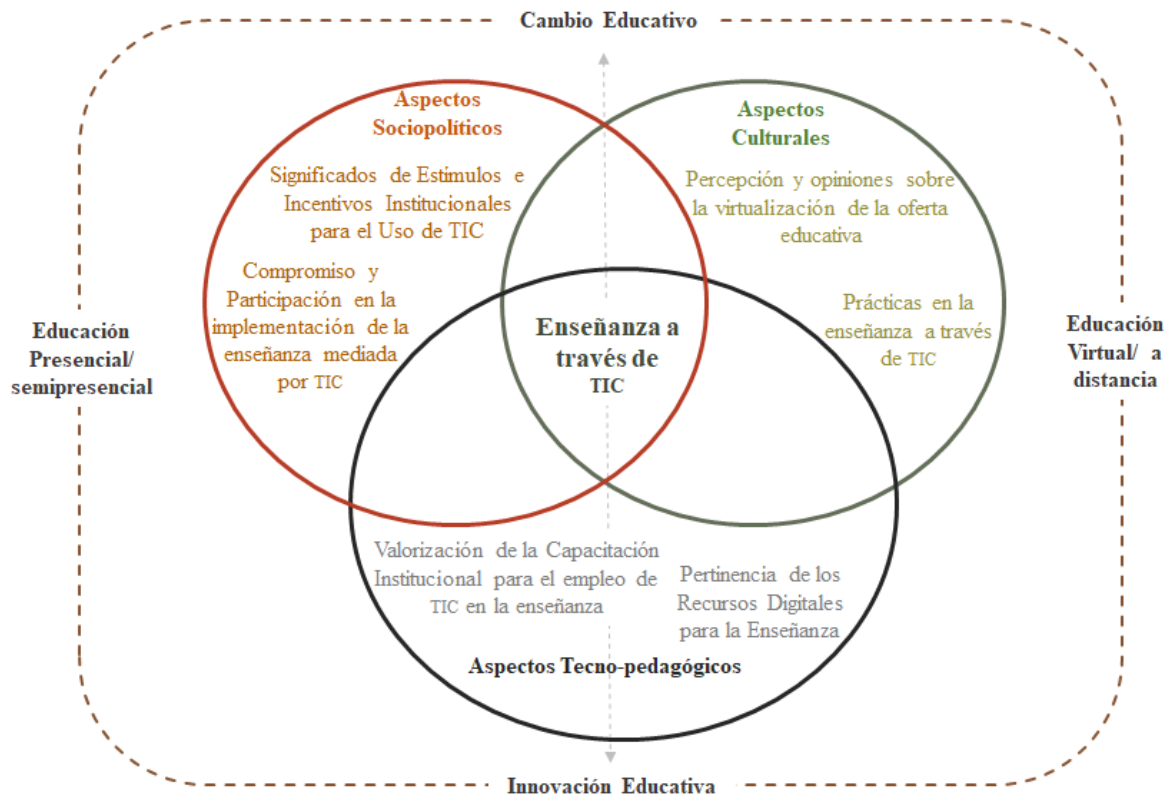
Fuente: Elaboración propia

Based on this instrument, 32 teachers assigned to different academic units were interviewed during the month of September 2019. Initially in San Luis Río Colorado (main headquarters of the institution), Hermosillo and Magdalena (units with the highest enrollment of students). Finally, it was applied in venues located in two other cities: Villa Juárez and Navojoa. Once the data had been collected, the analysis was carried out from a hermeneutical triangulation, understood as a procedure of gathering and dialectical crossing of information and that, in terms of Cisterna (2005), implies selecting the information by levels, triangulating the information between estates and later with the theoretical framework.

From the transcription of the interviews, the analysis was started with the support of the Atlas.ti software. First, a selection of the information was made that allowed the identification of the pertinent elements in accordance with the research objectives. In each interview, a coding exercise was carried out to group topics that allowed to identify, summarize and synthesize what each of the informants expressed. This exercise then made it possible to establish codes in each of the interviews. After this, a triangulation was carried out between estates (Cisterna, 2005), which implied identifying and classifying the codes that

were related or pointed to the same topic among all the interviews. In other words, all the codes that indicated information on the same topic were grouped, which allowed the formation of subcategories.

The results of each subcategory were contrasted with theoretical references to identify situations that are noticed from the literature. On the other hand, elements that had not been previously contemplated were also identified, such as in the testimonies that point to the prior training of students as an obstacle to effectively develop teaching through technologies. This exercise of reviewing subcategories and contrasting information allowed the pre-established categories to be redesigned. Thus, the information was structured as follows (see table 1).

Tabla 1. Relación de dimensiones, categorías y palabras clave del estudio.

Dimensión de observación	Categorías	Subcategorías	Palabras clave (códigos)
Tecnopedagógica	Desvalorización de TIC	Limitado acceso a infraestructura tecnológica	Equipamiento limitado, métodos de adquisición de equipo, equipo suficiente.
		Sensación de poca utilidad y mal aprovechamiento de equipo	Equipamiento en buen estado, necesidad de licencias de *software*, equipo mal colocado en las aulas.
		Desvalorización de plataforma virtual	Desconocimiento sobre uso de plataforma, desinterés por utilizar la plataforma, preferencia por modalidad tradicional.
	Sensación de limitaciones didácticas a través del uso de TIC	Inconformidad con diseño de secuencias didácticas	Secuencias didácticas desactualizadas, secuencias didácticas poco flexibles, secuencias didácticas pertinentes.
		Percepción de la educación virtual como limitante para la enseñanza a través de la práctica	Enseñanza centrada en el alumno, planteamiento de ejemplos, muestra de aplicación del conocimiento, uso de TIC como limitante.
	Problemáticas de planeación en la capacitación docente	Capacitación desactualizada	Falta de instructores expertos en el área, necesidad de nuevas capacitaciones, sensación de desapego de capacitación con necesidades docentes.
		Incompatibilidad entre horarios de	Problemáticas con horarios de capacitación, sensación de poca utilidad de capacitación,

		capacitación y carga académica	desinterés por el contenido de los cursos.
Cultural	Inclinación hacia la educación presencial-tradicional	Preferencia por la enseñanza presencial-tradicional	Obligatoriedad de plataforma como limitante, mayor tiempo de estudio al estudiante, falta de equipamiento, desinterés de docentes por enseñanza virtual.
		Sensación de baja calidad educativa en modalidades no presenciales	Sensación de baja calidad educativa en modalidad virtual, preferencia por educación presencial-tradicional, motivación por modalidad presencial.
	Resistencia al cambio educativo e innovación a través de TIC	Resistencia al cambio educativo a través de TIC	Resistencia al cambio, motivación por uso de TIC, desmotivación por falta de capacitación, sensación de falta de apoyo entre colegas, sensación de apoyo suficiente entre colegas.
		Desinterés por innovar en la enseñanza a través de TIC	Desinterés por empleo de TIC, interés por empleo de TIC, inconformidad con equipamiento.
Sociopolítica	Percepción negativa y desconocimiento sobre programas de estímulos institucionales	Desconocimiento de programas de incentivos institucionales	Desconocimiento sobre programas de incentivos, necesidad de incentivo evaluador para el uso de TIC, desvinculación de programas de estímulo con objetivos de calidad educativa de la institución.
		Percepción negativa acerca de la comunicación con directivos	Capacitaciones entre colegas, poca comunicación entre profesores, comunicación con directivos necesaria, falta de

			atención a opiniones de profesores, evaluación al desempeño docente como condicionante.
	Escaso seguimiento a propuestas e inquietudes del personal docente	Problemáticas relacionadas con el diseño de secuencias didácticas	Elaboración de secuencias por profesores inexpertos, falta de capacitación sobre elaboración de secuencias, elaboración de secuencias entre colegas.
		Incertidumbre en relación con el seguimiento de propuestas otorgadas en academias	Falta de atención a comentarios hechos en academias, sensación de trabajo en forma de reporte en academias, percepción sobre poco interés en profesores por atender problemáticas en academias.

Fuente: Elaboración propia

Finally, the results were categorized from the testimonies analyzed, in such a way that, for this text, the results that made up the categories have been taken up: "Devaluation of ICT", "Didactic limitations through ICT", "Perception negative on institutional stimuli "and" Resistance to educational change".

Results

First of all, it is pertinent to point out that any review of the information collected is carried out from an impartial position. This implies recognizing that the use of technologies in education can bring both benefits and problems, depending on how the implementation process is carried out and how it is internalized by the actors involved.

In this sense, the analysis of the limitations and scope of the technologies in teaching is carried out through questions that allow us to deepen and not only describe events. From this position, it was identified that the informants point to teacher training, Internet connectivity in the institution, uncertainty about the use of the digital platform, resistance to change and ignorance of incentive programs as the main obstacles to conceive the use of technologies as an improvement in teaching.

From the investigation, it was possible to identify three elements that were pointed out by different informants: 1) institutional training as an obstacle, 2) poor Internet access on campus, and 3) devaluation of virtual tools. Some of the testimonies expressed it as follows:

> The internet is very slow at school and it takes a long time to use the platform as it sometimes fails. Furthermore, many teachers do not know how to use it (Informant 2, San Luis Río Colorado).

> They only give us a training course at the beginning of each semester and they assume that one already knows everything, but there are many basic things that some teachers still do not know and need to be explained (Informant 14, Hermosillo).

> I think we all agree that it is important to use technology, especially in these times, but not everyone has the time to learn and some teachers are already from another generation, in which technology was not used" (Informante 19, Hermosillo).

The foregoing shows that the issue of technological infrastructure has not been overcome. In other words, even though the virtual platform tool has been proposed as something necessary and also mandatory, in some campuses they lack the appropriate conditions for each teacher to be able to work through virtuality. That the internet service presents recurring failures is not a minor matter when virtuality is the strategy to follow to achieve objectives related to educational quality and in particular to teaching.

In some academic units there is only one training per semester and this is indicated as unrelated to the needs and concerns of some teachers, which can be interpreted in two ways: the lack of training and the quality of these training. This supports the fact that investment in infrastructure alone is insufficient to achieve all of the expected results and also allows us to consider the perception of some teachers who consider that mastering the technologies requires too much time.

In addition to the above, these testimonies allow us to infer that, despite the fact that the trainings have been carried out, there are still doubts about the benefits and the way to use ICT to contribute to the improvement of teaching. Regarding this point, Ducoing (2003) stressed the relevance of taking into account the context of the institution when providing training, which must respond to the particular needs of academics, according to their circumstances and what is to be improved. In this sense, a situation can be configured in the

opposite direction to the recommendations of Unesco (2006): provide teachers with training in which, in addition to preparing them for the use of technological equipment in the classroom, it also emphasizes its use pedagogical, as well as in the intervention of the design, the adaptation of the curriculum and in the development of digital materials for use in teaching.

On the other hand, other negative aspects and needs were identified that refer to holding meetings with colleagues to clarify doubts and attend to them based on the needs of the teachers. Among the testimonies, it stands out that the opinion of the teaching staff is not taken into account by their superiors (directives), as well as the lack of follow-up on their progress after training. In addition, it is stated that they do not participate in any incentive program for teacher performance due to lack of time and training, and that the evaluation that students make of teachers influences their teaching activities.

> More meetings are needed between us to organize ourselves better and resolve doubts because the courses they give us are good, but there is no way to receive feedback and sometimes some teachers forget the things they saw in the course (Informante 15, Hermosillo)

> We have been trained in courses on the educational model, as well as in the use of the digital platform, but training is needed on conducting academic discussion forums with students and fellow professors (Informant 1, San Luis Río Colorado).

Based on these findings, the need for a program that provides relevant advice and contributes to the proper use of technologies in teaching practice is conceived, which is a legitimate and also favorable concern (Marcelo, 2013). However, such statements also allow us to interpret a somewhat diffuse reality in relation to teacher training. In addition, they give rise to other questions that go beyond whether the teacher was trained; They extend to whether teaching practice has been improved through the use of technologies.

On the contrary, the belief of some of the teachers is that technologies can contribute to improving teaching and that, even when the courses do not have continuity through feedback, they consider that a modification of their courses is necessary, which suggests a certainty interest on the part of teachers in learning from an adequate training process. In turn, and when contrasting these testimonies with those raised above, it can be seen that there is a point in common: training. When it seems that teachers do not always feel motivated to

use technologies due to a generational issue, perhaps this is not necessarily the case, perhaps it has nothing to do with age, but with a training that is not very stimulating and sometimes disconnected from their own interests. of the teaching staff.

In this sense, regarding the motivations offered by the institution to promote the use of technologies in the teaching exercise, the informants pointed out that the teaching evaluation carried out by the students harms the subject teachers and then they are hired again; Due to this, some professors modify their teaching practice based on what they consider will help to obtain a good grade from the student, although there are also those who are not aware of these incentive programs at the institution.

> Here there are no incentive programs that have to do with the use of technologies, before they supported you to go to diplomas and train you, but no longer, and the programs that exist are only for research (Informant 7, San Luis Río Colorado)

> They seem fine to me because if a group of students to whom I taught pass the Ceneval they give us an extra bonus, but there are also others like the [Program for Teacher Professional Development, for the Superior Type] Prodep, but I don't know how it works (Informant 22, Magdalena).

> The evaluation influences a lot because you have to like the students since that is what they evaluate sometimes they do not pay attention to how you gave the class or how much you prepared and if you are on individual hours and the students do not approve of you then you no longer They hire again (Informant 13, Hermosillo).

These types of comments allow us to suppose a distancing from the intentions for innovation in teaching that are established in the institution, since, as López (2015) argues, each institution is diverse and has its own particularities in terms of its operation, assume them as such allows an approach to the reality that exists in higher education.

However, it can also be recognized that some teachers consider that the institution does not provide incentives, which may result in the absence of motivation; or on the contrary, there is a lack of knowledge about how to receive incentives to adapt their practice to the objectives of the institution. Be that as it may, both cases are alarming, especially if incentives are assumed as catalysts that enable change and the teacher's commitment to what it is intended to innovate (Parra, Gómez & Pintor, 2014). At the UES, this goes even further,

and it is that while, on the one hand, some teachers have not been able to identify the existence of stimulus programs, on the other, for those who have, said programs have had negative effects that have impacted at least indirectly in the use of technologies.

An example of this is the salary compensation program that considers as a condition that the student's grade, provided by the teacher, exceeds an average of 8.4 in the semester and, in addition, that the students indicate as satisfactory the teacher's performance in the subject (UES, 2021). This last point is mostly reflected in subject teachers who are hired for a specific time, since meeting the criteria indicated is necessary for their continuity in the institution.

In general, both professors who are interested in salary compensation and those who intend to continue teaching at the institution have the requirement to adapt their performance and evaluation criteria; Therefore, the use of technologies is permeated, in some cases, by the intention of generating sympathy in students to obtain satisfactory grades with each other, and this is generally not linked to pedagogical aspects that allow a better development of teaching. Rather, conflicts of interest are generated that demotivate the teacher, which causes that before wondering how to use technologies properly to take advantage, they first wonder what to do so as not to receive a bad evaluation from the student.

The above situation suggests a need to rethink incentive strategies on the part of the institution; also to disseminate the programs so that more teachers adapt their practices according to the institutional objectives. Thus, the investment in technological infrastructure that is carried out may favor both the increase in enrollment and the improvement of teaching.

The use of technologies in teaching can favor the development of different scenarios, each with different characteristics. Some UES professors, who have technological equipment, but are not interested in using it, occupy one of these scenarios; yet another is conformed as a result of the lack of training, or the lack of interest and their belief that technologies do not improve what is traditionally done in the classroom. This type of situation reveals a more complex problem, since the limitations to use technologies in teaching are shown in different routes.

Another notable aspect has to do with the supposed mandatory use of technologies in the institution, since the use of a virtual platform has been proposed in all the subjects of the institution. However, there is no supervision on how teachers use these systems, to such an extent that it is assumed that there are those who definitely do not use them. In this regard,

Trepule, Tereseviciene and Rutkiene (2015) have noted the necessary conditions to effectively use technologies in teaching processes. On the one hand, they suggest focusing on the student's learning needs, since teachers with more constructivist procedures are more likely to generate a positive learning environment. On the other hand, they recommend recognizing advantages such as the possibility of accessing information and limitations such as the little interaction it allows with students. In any of the variants, each teacher needs to make an effort to understand the student's training needs.

However, we must not forget the requirement for teachers to interact with the student in a virtual way. According to Ducoing (2020), the interaction between teacher and student is one of the essential elements that can greatly improve what is taught. Despite this, in non-face-to-face teaching modalities supported by technologies, discussions between classmates, the exchange of ideas between teacher and student, and interaction activities seem to be a little less frequent than in face-to-face teaching. This is an issue that institutions must attend to: from the curricular design and the didactic guidelines that are established in a specific educational model to the planning of the training that will be given to the teachers. In this sense, the institution needs to take into account the needs to constantly offer training courses. In general, strategies that allow expanding the possibilities of teaching in virtual environments.

An emerging scenario: higher education in times of pandemic

A problem that is directly related to the exposed situation has to do with the current scenario in which higher education is found worldwide, and that was generated by the health contingency due to the 2019 coronavirus disease (covid-19) (Moreno, 2020). An unprecedented scenario that has the potential to mark a before and after in the teaching practice (Bravo and Magis, 2020).

In the Mexican context, on March 14, 2020, the Ministry of Public Education (SEP) issued a preventive measure with the purpose of mitigating infections, which implied ceasing educational activities in person at all educational levels; the return to class happened virtually. The effects, opinions and positions that this generated were somewhat diverse and until now it is not possible to assume that the entire academic staff has managed to adapt to this new normal.

Díaz-Barriga (2020) affirms that the teacher training to meet educational needs from virtual environments granted by the SEP has focused on instructing about the design of learning objects and online work sessions through the use of the tools offered technology, which has reduced the teaching profession to a technician who chooses materials to work with their students, that is, for the purposes of these trainings, neither the conditions of the teachers nor the families have been analyzed. In short, each teacher has seen the need to learn from isolation both the technical mechanisms of virtual education that have not been clear to them and the design of new ways of teaching through tools that not everyone was used to using, which has generated diverse positions, concerns and disagreements that make evident the need to carry out measures that take into account the needs of teachers (Ruiz, 2020).

What is intended to rescue with these remarks is a kind of contrast between the current scenario of education and the results of this research work that reveal different ideas, concerns and positions regarding the relevance of technology in education, but also with regard to the relevance of teacher training. It must be clear that even when we are facing an emerging scenario, where health measures are essential and the ways of teaching represent the mandatory inclusion of virtual environments, this does not necessarily raise new problems. The pandemic, then, only reveals problems that already existed, and that to date have not yet been solved. And yes, although not exclusively, in some cases they have not been solved due to the resistance to change of a large part of the teaching staff in each institution. That is, although when implementing technologies there is information regarding problems outside the teaching staff (such as the training offered by the institution or investment in technological infrastructure), it can also be seen that there is great resistance to change by teachers who assume their profession as something static, which should not and cannot be made different, even when educational contexts demand otherwise.

Discussion

According to Cobo (2019), for decades it has been argued that a skillful use of technology makes it possible to generate advantages for those who manage to adapt to these new tools; now both the Internet and various technological resources have ceased to be conceived as a tool for inclusion and its problems have promoted other forms of power and control. There is talk then of new digital divides that, among other things, are visualized

through an apparent obsession of certain individuals for the construction of new relationships in the digital world.

For this, Diez, Aparici and Gutiérrez (2003) propose to rethink technologies, not as a set of instruments, but as the result of the web of social relations (and power) that at each moment in history have had politically predefined goals. . In other words, technology can - and should - be defined as the result of social relationships that produce tools, instruments, procedures under a specific organization, goals and objectives. From this perspective, technology acquires the dimension of a human product and facilitates a critical analysis.

In that sense, this text focused on seeing how technologies are understood in this set of social relations within an educational institution. This approach makes it possible to identify elements that can be assimilated to the approaches addressed in previous studies related to this topic and, therefore, confirm some of the approaches that allow understanding the object of study.

Such is the case of problems in institutional stimulus programs. Luzardo, Sandia, Aguilar, Macias and Herrera (2017) state that one of the key elements in the process of implementing an innovation that includes the use of technologies in an educational institution involves properly defining an institutional strategy that includes prior planning of the Actions to be carried out, where the purposes and value of the implementation of the proposed innovation for the institution are also made explicit. It is under this same logic that Loor and García (2020) suggest that educational institutions can design incentive programs that, in addition to generating motivation, allow staff to understand what is expected to be achieved with each innovation.

Likewise, Navarrete and Mendieta (2018), through a study aimed at investigating the integration of ICT in the Ecuadorian educational context, found that there are still several teachers who are not willing to use technologies, but who, in addition, continue to showing traditional practices that are not in accordance with the new scenarios and current demands of education. In addition, and from a somewhat more local perspective, Palomino, Olivas, Robles and Pestaño (2014) recovered information through a questionnaire on the educational model of the UES that was applied to graduates, who pointed out as insufficient both the diversification of didactic sequences such as internet access in the institution.

However, this text also reveals some differences with other investigations and that go hand in hand with the particularities of the institutional context that has been analyzed. This,

in turn, represents a set of elements that it is suggested to deepen through new studies aimed at investigating two main themes: student-teacher evaluation in virtual contexts and the feasibility of innovative teaching through technologies in the context Mexican.

Regarding the student-teacher evaluation, the testimonies reveal complex situations that must be rethought in order to identify ways to reduce bias on the part of the student, in such a way that teachers have the possibility of taking advantage of the evaluation to improve their exercise teacher. It is a multidimensional issue that can be considered from the aforementioned to the institutional actions based on such evaluation, that is, how favorable will it be for an institution to condition the permanence of subject teachers based on a student-teacher evaluation? Reflecting on this when investigating teaching strategies through technologies can favor the visualization of new ways to improve the student-teacher relationship in virtual educational contexts.

Regarding the feasibility of an innovative teaching through technologies in the Mexican context, it must be recognized, first of all, that even when education supported by technologies, and even non-face-to-face teaching modalities, represent a trend that is increasing In the universities of Mexico, basic and upper secondary education are still predominantly taught through face-to-face educational modalities. This makes it necessary to investigate how prepared students are to face the challenges represented by the modalities offered in higher education institutions, or the institutional strategies that contemplate the use of technologies in teaching but from the student's perspective. It is essential, then, to retrieve information about what is done in institutions to prepare students with respect to the educational modality in which they are enrolled and to provide suggestions that reorient institutional strategies on the use of technologies.

Conclusions

Training in universities has been increasingly oriented towards a hybrid offer that considers the use of technologies as the central axis for its operation. Consequently, institutions are constantly in need of investing in technological infrastructure, but also in adapting their educational models to take advantage of some of the benefits that technologies can offer to teaching. This implies, in turn, training each teacher in such a way that they understand when, how and for what to use the technologies. This situation has generated a series of challenges that are faced differently in each of the institutions and that also generate

different results in the perception of each teacher. The foregoing makes it pertinent to delve into the experiences of teachers with respect to the use of technologies.

Regarding virtuality as a means to improve teaching, the testimonies recovered in this document reveal a somewhat discouraging scenario, but that is not why it is unbeatable. On the one hand, even though some teachers have an optimistic perception about the use of technologies, there do not seem to be notions that link the virtual platform with the adaptation of didactic aspects. In the institution, the teaching exercise through the virtual platform is perceived as an activity that requires better training, but, at the same time, it is assumed that there are subjects that cannot be carried out from virtuality and this is not always It is exposed in relation to the lack of training, in such a way that some teachers observe virtuality as limiting and the possibility of rethinking teaching strategies is not always addressed. At the same time, another of the aforementioned aspects points to the need for a reconfiguration of the institutional stimulus program, in such a way that the use that is given to technologies within the classroom is encouraged.

It is also necessary for teachers to understand what they are expected to do from an institutional perspective, and this does not seem to be understood in the same way by all staff at the institution. That is, that institutional strategies are conceived as a system that guides to overcome the limitations of the use of these means, regardless of the educational modalities. Under the same logic, when thinking about technologies in the educational field, it is not only necessary to stimulate their use, but also the way in which they are used. That is, technologies are not only computer, projection, audio and software equipment that can be acquired to be used in an indistinct way, since this, instead of giving positive results, becomes a process of misinformation and deviation of the purposes of teaching

This expected situation is contrasted with a different reality in the UES, which can be seen from the testimonies analyzed. To counteract, the university needs to plan its stimulus program from a perspective more oriented to encourage the expected use of technological tools, but also of the needs of the teaching staff. At the same time, training that allows the conception of the objectives proposed in the stimulus program. Likewise, it is pertinent that both the requirements to participate and the incentives of each stimulus program in the institution be made explicit, since some problems that were pointed out point to ignorance of the programs and allow inferring a certain demotivation at the time of implementing new methods of teaching. As long as these aspects are not addressed, the conception of an

innovation through the use of technologies in teaching will continue to seem like a far-off scenario.

Contributions to future lines of research

During the development of this work, it was possible to identify two thematic elements that cross the object of study in a transversal way. To delve into the subject, it is considered pertinent to complement the information from an inquiry that addresses problems about the programming of virtual hours that are used in non-contact modalities, because one of the recurring findings has to do with a possible dissatisfaction on the part of teachers with virtual hours of a subject. Some teachers consider that more supervision of their fellow teachers is necessary for the virtual hours to be effective, since it is not clear how to perform at those times.

The testimonials range from a feeling of limited use in the platform functions to perceptions of little use due to lack of training ;; in other cases it is pointed out that the implementation of virtual hours limits teaching in more practical subjects, which, in certain cases, is considered indispensable and irreplaceable.

Another emerging issue refers to the situation of the student entering higher education, and especially her abilities to perform in virtuality. This theme infers a central theme that little has been studied from the perspective of educational innovation. In the analyzes on the effects of teaching through technologies, the student's previous training sometimes goes unnoticed, and therefore institutions tend to implement different educational modalities, even when there are students who throughout their lives were only educated in the same modality , the face-to-face.

Thus, based on the information provided by the testimonies, it was possible to identify the relevance of self-learning for students enrolled in the UES, which is related to the teaching exercise, since teachers manifest difficulties in interacting with those students who are not used to working in virtuality. This refers to the absence of a self-learning habit, understood as an obstacle that complicates the teaching exercise due to the feeling that the student without experience in virtual education modalities never develops this capacity.

Therefore, it is recommended that, even though what is exposed in this document can provide guidelines to improve the implementation of technologies in the teaching of higher education, the study of the trajectories, abilities and requirements of students to learning in

virtual education, only in this way will it be possible to have a broader perspective that, in addition, will allow a better approach to recognize the possibilities of success when talking about an educational innovation that proposes to support the performance of teaching.

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