Pedagogical innovation with the use of ICT: perceptions of faculty members from Brazil, Spain and Mexico about their practices

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ABSTRACT. This article emerges from an exploratory qualitative study conducted with faculty members from higher education institutions in Brazil, Spain and Mexico. The goal of the study was to analyse the perceptions of faculty members from the looked at institutions, on pedagogical innovation resulting from the use of Information and Communication Technologies (ICT) in their teaching practices. The data were collected through a semi-structured questionnaire forwarded by e-mail. Content analysis technique was used to study the data. Results showed three types of perceptions held by faculty members in relation to pedagogical innovations arising from the use of ICT in their practices. Most firmly believe and identify innovations resulting from the use of ICT. A smaller number of participants also identify innovations, but point out that, in addition to the use of ICT, they are the result of the teacher's attitude. There is also the opinion related to the saturated use of ICT, without the perception of innovation.

Keywords: teaching; didactic strategy; motivation.

Inovação pedagógica com o uso das TIC: percepções de docentes do Brasil, Espanha e México sobre suas práticas

RESUMO. Este artigo emerge de um estudo exploratório qualitativo realizado junto a docentes de instituições de ensino superior do Brasil, Espanha e México. O objetivo do estudo foi analisar as percepções dos docentes das instituições investigadas sobre a inovação pedagógica decorrente do uso das Tecnologias da Informação e Comunicação (TIC) em suas práticas de ensino. Os dados foram coletados através de um questionário semiestruturado enviado por correio eletrônico. Utilizou-se a técnica da análise de conteúdo para a análise dos dados. Os resultados mostram três tipos de percepções que os docentes têm sobre as inovações pedagógicas decorrentes do uso das TIC em suas práticas. A maioria tem convicção e identifica inovações a partir do uso das TIC. Um menor número de participantes também identifica as inovações, mas salientam que, para além do uso das TIC, elas são resultado da atitude do docente. E, também, há a opinião de saturação no uso das TIC, sem a percepção de inovação.

Palavras-chave: docência; estratégia didática; motivação.

Innovación pedagógica con el uso de las TIC: percepciones de docentes de Brasil, España y México sobre sus prácticas

RESUMEN. Este artículo proviene de un estudio exploratorio cualitativo realizado junto a docentes de instituciones de enseñanza superior de Brasil, España y México. El objetivo del estudio fue analizar las percepciones de los docentes de las instituciones investigadas sobre la innovación pedagógica resultante del uso de las Tecnologías de la Información y Comunicación (TIC) en sus prácticas de enseñanza. Los datos fueron recolectados a través de un cuestionario semiestructurado enviado por correo electrónico. Se utilizó la técnica del análisis de contenido para el análisis de los datos. Los resultados muestran tres tipos de percepciones que los docentes tienen sobre las innovaciones pedagógicas resultantes del uso de las TIC en sus prácticas. La mayoría tiene la convicción e identifica innovaciones a partir del uso de las TIC. Un número inferior de participantes también identifica las innovaciones, pero destacan que, para más allá del uso de las TIC, ellas son el resultado de la actitud del docente. Y, también, hay la opinión de saturación en el uso de las TIC, sin la percepción de innovación.

Palabras clave: docencia; estrategia didáctica; motivación.

Introduction

The integration of Information and Communication Technologies (ICT) in the educational process has led to a series of changes in teaching practice, such as the promotion of pedagogical innovation in the teaching-learning process. These changes come together with questions, difficulties and uncertainties, but also bring new opportunities.

However, starting to use technological resources in their practice does not automatically turn teachers into innovative subjects, as there are other factors that also influence this type of practice. Therefore, when analysing this topic, it is essential to consider at least the following aspects: a) geographic (location of institution - country, state and city/town); b) institutional (the institution's structure, organisation, culture and educational policy); c) personnel (teacher education itself, theoretical beliefs about teaching, position in relation to the use of ICT in teaching, motivations, etc.); and d) instrumental (when considering potential advances and applications of technological resources) (Montero & Gewerc, 2010).

On the other hand, pedagogical innovations are also closely related to teaching strategies used in class (Vázquez-Cupeiro & López-Penedo, 2016), as well as with the creativity employed. In fact, creativity may be understood based on a human subjectivity creation process (Mitjáns, 2003).

Nevertheless, in addition to decision and action by the teacher, promoting innovation also depends on favourable institutional conditions. In other words, educational institutions should become flexible and produce ways of integrating ICT in the teaching and research area, as well as at the managerial level, providing appropriate equipment and infrastructure (Salinas, 2004). Furthermore, they should seek to develop actions to encourage the use of ICT in teaching, with the aim of improving quality in the teaching-learning process, also incentivising the use of free software (Llorens, 2009).

In the current perspective, there is the understanding that higher education institutions, which focus on modernity, internationalisation and strive to achieve the best results, have chosen technologies as their talisman (Escobedo & Arteaga, 2015). There is great enthusiasm to digitalise institutions.

Hence, the importance of ICT in the educational environment is ever greater. This can be noticed, for example, in the curricular and technological adaptations adopted by universities in Spain, due to the European Higher Education Area, whose changes are taking place aimed at providing for the student's full and continuous education, based on creative and autonomous learning (Gijón & Crisol,

2012). Between 2003 and 2013, the federal higher education network (free of charge universities) was restructured in Brazil, which allowed for an increase in the number of universities, from 45 in 2003 to 63 in 2014. There was a call for degree courses to be designed and implemented with the perspective of curricular innovation and methodologies, focused on learning, interdisciplinarity and development of critical reflective positions in relation to contemporary world discussions. In this context and within the perspective of curricular and methodological practices, innovation, initiatives and projects were developed. Many of them relate education to digital culture and the importance of digital technologies (Prata-Linhares & Siqueira, 2014). In relation to Mexico, new official documents – Educational Model and 2016 Curricular Proposal for education –, which present the main idea of promoting a change in the country's education (Díaz-Barriga, 2016), among other responsibilities, also stipulate teachers should learn how to use ICT, so that they may be employed broadly in the teaching-learning process.

Obviously, the results reached so far are not equivalent, as aspects like time, background, recognition and support (associated to each country's peculiarities) consist of concrete demands from teachers to incorporate the use of new technological resources to their practice. Therefore, the need for changes in the teacher education model may be seen, one that may actually promote significant transformations in the educational methodologies, thus, contributing to the improvement of the teaching practice (Correa & Paredes, 2009).

This qualitative paper is the result of a research project, which proposed to identify and understand the main innovations and pedagogical changes in teaching practice, such as the use of ICT in teacher education courses in Higher Education Institutions in Brazil, Spain and Mexico. The research problem that guided the study is the following: what are the main characteristics of innovative teaching practices in educational institutions from different countries?

The research was developed based on the assumption that, in the current scenario in which we live, the rapid development of technology has expanded the ways through which interaction takes place between a user and the technological mean, providing a greater number of possibilities for the search of information and its communication. Thus, on one hand, ICT may become a valuable instrument to be constantly incorporated to academic activities, as through their potential, scope and innovation they offer new support to teaching-learning processes, generating new spaces for socialisation even.

On the other hand, in the same way it may be extremely relevant for education, it is possible that ICT do not necessarily bring anything new to teaching (Sancho & Alonso, 2012; Paredes, 2013). This happens in case teachers decide not to update their use, nor develop new activities with them, many times, restricting the innovation that comes hand-in-hand with them to technological innovation itself, leading to the innovation of the process to be lost.

This article presents part of the study's findings. Specifically, those related to the perception of faculty members from the studied institutions on pedagogical innovation in their practices. Perception, which here is understood as a reflection process conducted by the subject on their needs as teachers, with the aim of detecting elements that may contribute to or make their daily work more difficult (Chehaybar, 2006) and thus, develop strategies to improve the teaching-learning process.

Referential framework

Issues referring to the use of ICT in teaching and about teaching practice have been the object of study of several authors (for example: Paredes, Murillo, & Egido, 2005; Cabero, 2006; Silva, 2006; Gonzáles, 2007; Moran, 2007; Paredes, 2008, 2009, 2013; Tejada, 2008; Molin & Raabe, 2012; Paredes & Arruda, 2012; Gallardo, Marqués, & Bullen, 2013). In general, these studies highlight how important ICT may be in education. However, they also point out that the use of technological resources in the educational process brings the need for some adjustments, which will require in addition to thinking about the use of such resources, the development of new skills and attitudes by teachers. These skills will allow the teacher to respond to the demands brought about by digital culture in classes, as currently, teacher education is strongly steered towards the instrumental (Sánchez-Antolín & Paredes, 2014).

Among various aspects present in these studies, those referring to successful (or unsuccessful) conditions in relation to the integration of ICT in the teaching-learning process stand out. The following question arises from this: will technological resources indeed turn into an advantage for activities developed by teachers and students, allowing for pedagogical innovation, or will they complicate their lives? This is understood to be related to the posture taken on by teachers and students vis-à-vis ICT, in other words, agreeing or refusing to use these resources. Refusal that may originate from personal conflicts, such as for example, the subject-teacher's own beliefs and behaviour (Achinstein, 2002), or institutional, referring to an institution's conceptual and structural values. This is an essential issue, as it refers to a possible change in behaviour. Some authors maintain that it is not easy to promote pedagogical innovation like ICT use, due to difficulties inherent to the behaviour change process, after all, if there are positive factors for this to occur, there are also limiting ones, which may hinder the developing of a proposal of this type (Paredes & Estebanell, 2005).

Therefore, it is fair to say that appropriation of technological resources by teachers does not happen in a uniform manner, as ICT present themselves differently to different people. Consequently, some use them sporadically and in a non-committed way, as they are not prepared to utilise them or because they do not know their reach and benefits (Chiappe, Mesa, & Alvarez, 2013), while others put them to a more advanced and regular use, making the most of the educational and communication possibilities offered by them (Paredes, 2008).

Therefore, the success of educational goals with the use of ICT has direct implications on the attitude of the teacher vis-à-vis these technological resources. It is difficult to achieve good results in educational practice with ICT if the teacher is not open to: a) engaging in a critical reflection on his/her real education needs; and b) a positive attitude to integrate them into their educational activities, seeking to create strategies and methods for intervention, cooperation, analysis and reflection on their pedagogical practice (Román & Romero, 2007).

Another aspect strongly present in the discussions conducted here refers to the issue of motivation triggered by introducing ICT in the teaching-learning process (for example, in: Hendriks, 1999; García, 2002; Tejedor, García-Valcárcel, & Prada, 2009; Karsenti & Lira, 2011). Integrating ICT in teaching practice, associated to the motivation for their use may be a factor that triggers innovative practice. Nevertheless, this type of practice is not limited to this, being related to other aspects (Paredes & Arruda, 2012). And as the theme 'innovation' constitutes an important axis of this study, a literature review was done, with the aim of finding ideas on the concept, which has been used in education currently.

This foray revealed that new studies have been showing denser focuses vis-à-vis processes in which innovation is involved, as well as with regard to the use of ICT in teaching practices, highlighting the growing number of factors that influence such processes directly.

Therefore, innovation concept notions also incorporate new aspects that arise from these more profound discussions, which will be presented

below. Nonetheless, in order to see how much these new focuses have developed, this explanation starts with a concept considered classic, in which innovation is taken for an idea, practice or object perceived as new by an individual (Rogers, 1983). This definition may be considered the starting point, but which obviously, can no longer provide new teaching situations where innovation is found.

Adding new approaches to Rogers' first idea, a more descriptive sense (for example, in: Figueiredo, 2011; Christensen, 2012) refers to two main types of innovation, incremental (or sustained) and disruptive. Incremental innovation is based on introducing improvements in products, processes, organisations and existing social systems (Figueiredo, 2011). Disruptive innovation points to the fact that it emerges in an exploratory way, and greater opportunities to innovate do not improve what is already there, but create solutions for needs still unmet (Christensen, 2012).

In other consulted studies (for example, in: Gallego, 2005; Martínez & Correa, 2010; Aceto, Dondi, & Marzotto, 2010), the concept of innovation has to do with issues related to the improvement and reach of learning. For these authors, innovation is present when it enables learning, with the support of ICT, to leave the 'school's walls', allowing for significant links with extra-school reality, triggering positive effects in students' education. This also finds an echo in the ideas advocated by Rubia (2010) and Sancho, Bosco, Alonso and Sánchez (2015), which added that teacher education should prepare in addition to students, responsible, dynamic and supportive citizens able to provide a broader 'reading of the world', ready to adapt to new situations and promote creativity, as well as personal and social quality.

Expanding horizons 'beyond school walls', Reis (2013) and Montero and Gewerc (2010) argue that innovation is characterised by the idea of changing something, but this change must be converted into an intentional proposal by the school, taking into account the community where it is located, with the aim of responding to its real, internal and surrounding needs. Other studies are added to this idea (for example: Dulac & Aleonada 2008; Roig, 2008), remembering that a proposal such as this should also move forward in concept, techniques, attitude and values, with the aim of improving human condition, in a critical and supportive attitude, striving for the common good.

On the other hand, there are studies where the innovation concept is linked to strategies adopted in the teaching process, integrating several complex elements and including the need to think of strategies that enable subjects to familiarise themselves with innovation, thus, facilitating the development of high level cognitive skills. This is because there are teachers, who even when using ICT resources, reproduce traditional pedagogical practices (Orozco, 2007; Muñoz-Cano, Córdoba, & Priego, 2012). Therefore, it is a 'negotiation' process with these teachers, aimed at creating opportunities for them to overcome such practices, building truly innovative formats. In relation to this 'negotiation', it is important to mention that teachers who are motivated to introduce technology in their practices, do so in a manner coherent to their beliefs vis-à-vis the use of ICT. Nevertheless, they are careful so as not to lose the stability they have incorporated to their professional careers (Marcelo, Yot, & Mayor, 2015).

Other studies maintain that the concept of innovation is related to integrating ICT in the curriculum, emphasising the need to promote curricular changes to overcome the limits imposed by traditional curricula, thus, advancing in innovative teaching practices (Masetto & Gaeta, 2015; Prata-Linhares & Gaeta, 2016). In a similar perspective, some authors claim that adopting innovative practices is based on a teaching-learning paradigm that makes curricular flexibility and coordination, as well as skill development its main strong suits (Alves, Morgado, Lemos, Cruz, & Oliveira, 2011). In addition to changes in the curriculum, innovation also implies changes in seeing, thinking, organising and coordinating disciplines (Salinas, 2009). This requires institutions to promote a reflection process on the procedures adopted, as well as on their administrative structures, in order to sponsor adaptations and adjustments to new teachers education programs formats required by society currently, like distance education.

There are other authors who agree with the fact that innovation requires changes in curricular elements (for example: Tejada, 2008; Losada, 2010), in the sense that such changes should be based on a common goal, aimed at improvement and growth at the personal, as well as the institutional level. On the other hand, they also recommend internal and qualitative changes in educational processes and their immediate contexts, with objective criteria.

Another aspect found in the literature review seeks to link the concept of innovation to personal desire and the teacher-student relation. Martínez (2008) comments on personal wishes and issues, in the sense that the desire and attitude of teachers should try to improve their teaching practices, in order to provide a better education for their students. There is also the linkage between the innovation concept and the teacher-student relation,

and between them and the construction of knowledge in the educational process, as an argument that pedagogical innovation does not simply happen due to the simple fact of using ICT in the classroom (Correa, 2010). Moreover, it is essential for pedagogical innovation to question the naturalised and reflection of subjects in the teaching-learning process, allowing for rethinking about challenges and building a new way of looking at reality (Correa, Fernández, Gutiérrez-Cabello, Losada, & Ochoa-Aizpurua, 2015).

However, one must not forget the presence of innovation such as the use of ICT in the dynamics of collaborative work done in a network, which provides education and training processes with new cooperative learning methods with impact on the development of interaction processes (Melaré, Neves, Seabra, Moreira, & Henriques, 2011). Social networks and their new dynamics, for example, represent a pedagogical potential whose research should be furthered.

The study from which this article comes from, proposed a qualitative approach to research pedagogical practices with ICT, with the aim of exploring the perception of faculty members from the analysed institutions in relation to the resulting pedagogical innovation.

Methodological procedures

The research has been characterised as an exploratory qualitative study, with the aim of establishing perceptions of the studied subjects on the characteristics of innovative teaching practices with the use of ICT.

Exploratory studies seek to develop and clarify ideas on not very explored issues, thus, enabling the drafting of more precise assumptions (Triviños, 1987; Gil, 1999) and with this, put together new propositions to guide future studies (Yin, 2014). In the case herein, the dynamic way through which technological resources develop and the rapid advance of its use at the education level, supports the choice for this type of study.

A qualitative approach was adopted because of the study's analytical objectives, in order to allow for flexible planning, enabling the coordination of perceptions from subjects from three different countries, each with their own geographic or educational peculiarities.

Considering the study's objectives, an unintentional probability sampling was adopted, which selects a subset of a given population, whose information can be considered to represent all of it (Alaminos & Castejón, 2006).

The study's methodological development was done in two stages: (a) reference data collection, through a questionnaire (remote); and (b) data analysis, based on Content Analysis (Franco, 2007; Bardin, 2011).

A semi-structured questionnaire (forwarded via e-mail) was answered by professors from courses offered by the studied institutions[1].

As it is a study on teacher education, professors from these courses (or equivalent) were chosen as subjects, from the Triângulo Mineiro Federal University (UFTM) in Brazil, the Universidad Autónoma de Madrid (UAM) in Spain, and the Escuela Normal de Tlalnepantla (ENT) in Mexico. Table 1, below, details the sample composition of the research subjects by institution / country and by gender.

Table 1. Make-up of sample of subjects taking part in the study.

	Professors contacted	Professors taking part	Women	Men
UFTM-Brazil	65	09	03	06
UAM-Spain	40	08	02	06
ENT-Mexico	17	10	07	03
Total	122	27	12	15

Source: The authors.

After settling on and adjusting the choice of subjects for the study, the next step was to get in touch with the heads of the departments of the involved courses, so that the research proposal and data collection procedures could be presented, and permission to get in contact with the faculty granted.

After getting the thumbs up from the department heads, the first stage, the data collection was started. To this end, individual contact was made with the courses' faculty members, inviting all of them to take part in the study by answering a questionnaire sent via e-mail (already forwarded in this initial contact). In the message sent a deadline for them to return the answered questionnaire was also set, as well as a consent form for the use of the data. The message also pointed out that the data would be dealt with following a confidentiality protocol.

Twenty-seven faculty members answered and returned the questionnaire and consent form sent to them.

In order to keep confidentiality, in the next section, where the results will be presented and discussed, the names of the participants will be identified by codes, assigned to them at random, with no relation to the order in which the questionnaires arrived by e-mail. The codes are as follows:

- Codes for Brazilian faculty members: DB1 to DB9

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[1] Approved by the Ethics Committee, according to protocol No. 1,417,195.

- Codes for Spanish faculty members: DE1 to DE8
- Codes for Mexican faculty members: DM1 to DM10

The data was analysed and interpreted in the second stage based on Content Analysis, where it can be seen that the observer's particular reading is valid and generalisable, helping clarify elements of meanings susceptible to conducting a description of mechanisms, which in principle were not understood (Bardin, 2011).

Moreover, to understand daily life situations it is essential to consider the environment where they take place, as well as the core of certain personal and institutional interaction spaces (Franco, 2007).

This situation reflects the exact subject matter researched in this study, in the extent that it focuses on different types of ICT uses by those taking part in the teaching-learning process.

Results and discussion

As mentioned in the introduction, the perception of faculty members in relation to pedagogical innovation in their practices will be addressed, which is one of the categories [2] that emerged in the study's data analysis process.

It has also been mentioned that the simple fact of starting to use technological resources in their practice, does not automatically turn teachers into an innovative subject. This is because there are other factors that influence this type of practice like personal, institutional, geographic or instrumental.

Therefore, it is worth remembering that the analysis is focusing on a diverse set of subjects, bringing with them their peculiarities in relation to their countries' socio-cultural, economic and political issues (in this case Brazil, Mexico and Spain), as well as aspects related to the educational contexts in which they operate.

When asked about their perceptions on pedagogical innovations arising from the use of ICT resources in their practices, 25 out of the 27 subjects responded that they identify innovations, while two of them said no. Out of the 25 faculty members that identify pedagogical innovations, 16 believe that the use of ICT has great influence in this result, while the other nine understand that the innovations derive from their attitude, despite also using ICT (nevertheless, two out of the nine warn of the saturated use of ICT).

Based on the study's overview, some of the subjects' opinions will be discussed and analysed below.

Hence, the data starts being discussed and presented with the opinion of participant DB1, as seen below:

> My pedagogical relation with ICT changed when I started dominating them, instead of the other way around. In other words, I use them as an additional resource and do not allow them to replace me, or my activities to depend on them. Thus, ICT provide me with support, so that innovations accessible to me are added when I deem necessary in my teaching practice[3] (DB1, 2015, p. 2).

The participant makes his/her position in relation to the role of ICT (for example, as support) in his/her teaching practice clear. In addition, he/she points out he/she does not depend on technological resources to perform their teaching role, assessing when innovative extras are necessary in his/her practice. This position seems close to the opinion by Marcelo et al. (2015), where teachers motivated to incorporate ICT to their practices, do so in a manner coherent to their beliefs in relation to the use of such resources, without losing the stability achieved in their career.

Another opinion comes from participant DM9. He/she says that:

> The innovation I have achieved after integrating ICT in lessons in various forms is reverse pedagogy, with the aim of reaching self-regulated learning[4] (DM9, 2015, p. 1).

This participant reports that he/she has been achieving innovative results with the use of ICT, referring to the 'flipped classroom', which in short, may be understood as a method aimed at changing the classroom teaching model, altering its traditional organisation logic. The student has access to the subject's material in advance to discuss the content with colleagues and the teacher in the classroom, which becomes a dynamic and interactive space, in the extent that it may encourage debate from several angles. All with the aid of technology.

This practice may be linked to the notion of innovation mentioned by Orozco (2007) and Muñoz-Cano et al. (2012), in the sense of thinking new strategies for the teaching process that allow for the developing of cognitive skills. Also, according to Salinas (2009), when it demands changes in the way of thinking and organising disciplines, which implies in promoting curricular changes and moving forward with innovative teaching practices (Alves

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[2] In addition to the category analysed here, another three emerged during the data analysis: 'Motivations to incorporate ICT to teaching practice'; 'The importance of creativity to promote pedagogical innovation'; and 'The main uses of ICT in teaching practice'.

[3] Original text: "Minha relação pedagógica com as TIC mudou quando eu passei a dominá-las e não elas a mim, ou seja, faço delas o meu recurso adicional e não permito que elas me substituam ou que minha atuação seja dependente dela. Assim, as TIC são meu suporte e apoio, de modo que as inovações que vem sendo acessíveis para mim são adicionadas quando julgo necessárias em minha prática docente".

[4] Original text: "La innovación a la que he llegado después de aplicar las TIC en el aula de diversa forma es la pedagogía inversa, a fin de lograr el aprendizaje autorregulado".

et al., 2011; Masetto & Gaeta, 2015; Prata-Linhares, Bossler, & Caldeira 2015; Prata-Linhares & Gaeta, 2016).

With an opinion close to the one just discussed, in the sense of changing the way a lesson 'traditionally moves', enabling cooperative work, participant DE5 says that his/her perception of innovation arising from the use of ICT is what

> […] fundamentally encourages collaborative work. With the use of ICT, the teacher starts playing the role of facilitator of students' work, leaving the lecture type lesson aside[5] (DE5, 2015, p. 1).

This practice is related to the assumptions presented by Melaré et al. (2011), as collaborative work provides to the education and teacher education processes with new learning methodologies that have an impact on the development of interaction processes.

Another participant, DB7, states:

> I can supply for a larger number of students, individually or in a group and at the same time, be involved with important activities in the implementation and consolidation of the teacher education degree course. Students are constantly switched on to anything that comes up in social networks, be it good or bad. I know that knowing how to use ICT makes it easier to contribute and bring students closer, so that they may be in touch with a larger number of important issues and quality for their education[6] (DB7, 2015, p. 2).

Two aspects stand out in this participant's report. The first concerns the stance with respect to the use of ICT in his/her teaching practice, showing a positive attitude in the sense of integrating them to his/her educational activities (Dulac, 2004; Román & Romero, 2007). The second aspect, which is driven by the first, is based on understanding innovation as a result of his/her decision of using technological resources, which according to him/her, helps in several activities performed as a teacher, including the facilitating of communication with students. Martínez (2008) identifies the possibility of innovation in this type of practice, such as the attitude of the teacher in attempting to improve their pedagogical practice, in order to offer better education to their students.

While expressing his/her perceptions in relation to innovation and changes arising from the use of ICT, participant DM2 says the following:

A very wide panorama is opened for students, as well as for teachers, as advances in science, the news and virtual communication establish themselves in a short period of time and thus, one may have access to knowledge from all over the world[7] (DM2, 2015, p. 1).

In DM2's perception, an important innovative aspect refers to how ICT facilitate 'access to knowledge from all over the world', favouring reflection on behalf of subjects involved in the teaching process, enabling the rethinking of challenges, as well as building a different look on reality (Correa et al., 2015).

Still in a positive perception about innovation, participant DE8 mentions that for him/her they are very useful, as they "[…] facilitate collaborative work, foster creativity and motivate students"[8] (DE8, 2015, p. 1). In relation to this stance, in addition to the already mentioned aspect, and vis-à-vis new methodologies supplied by collaborative work (Melaré et al., 2011), the participant points out the personal aspect in the process involving innovation (Martínez, 2008), in this case referring to students' motivation and creativity, facilitated by using ICT in teaching practice.

Participant DB5's perception is a little different from the ones described so far. He/she says that:

> I do not know to what extent there is actual pedagogical change triggered by the use of ICT in my teaching practice, as they have been consolidated and are often used in teaching. I see little innovation, but I do see contributions, because I have to dedicate many hours, more than for traditional classroom activities, and I end up thinking a lot more about my lessons, trying to get to know my students better, in order to create truly appropriate activities[9] (DB5, 2015, p. 3).

A possible interpretation of DB5's view, who says to notice little innovation in his/her teaching actions, would be to credit the perception to a pedagogical practice that has reached a certain level with the use of technological resources and then stagnated. However, his/her subsequent words reveal an engaged and reflective attitude in relation to teaching, concerned with qualifying his/her relation with the students, getting to know them better and thus, proposing new activities that favour the

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[5] Original text: "[…] fomenta fundamentalmente el trabajo cooperativo. Con la utilización de las TIC el profesor pasa a ocupar un papel de facilitador del trabajo de los alumnos, dejando de lado el tipo de clase magistral".

[6] Original text: "Consigo atender um número maior de alunos, atendimento individual ou em grupo, e, ao mesmo tempo, estar envolvido com atividades importantes na implantação e consolidação do curso de licenciatura. Os discentes estão constantemente ligados em tudo que aparece na rede social, coisas boas e ruins. Sei que o meu domínio das TIC facilita a aproximação e a contribuição para que o discente receba um maior número de assuntos importantes e de qualidade para a sua formação".

[7] Original text: "Se ha abierto un panorama muy amplio, tanto pata los estudiantes como para los docentes, ya que los avances de la ciencia, las noticias y la comunicación virtual se establecen en muy poco tiempo y así se puede tener conocimiento de todo el mundo".

[8] Original text: "Facilita el trabajo colaborativo, fomenta la creatividad y motiva a los estudiantes".

[9] Original text: "Não sei até que ponto há realmente mudança pedagógica provocada pelo uso das TIC na minha prática docente, uma vez que essas já estão consolidadas e frequentemente utilizadas no ensino. De inovação vejo pouco, mas vejo contribuições, pois tenho que me dedicar muitas horas, mais do que para a atividade presencial, e acabo por pensar muito mais minhas aulas e buscar conhecer melhor meus alunos, no sentido de criar atividades que realmente sejam adequadas".

building of knowledge (Correa, 2010). Therefore, although one may disagree in part with the 'perception holder', the use of ICT in his/her teaching practice may be seen to present innovative aspects.

Another opinion that reinforces the issue of the attitude adopted by the faculty member to achieve innovative practice comes from DE6. According to him/her:

> I do not think there is any innovation for the simple fact of using ICT. Innovation does not necessarily have anything to do with the use of ICT: it may do, it may not. Innovation is part of the teacher's attitude: the use of ICT, in this case, is a consequence and a means of innovation. It is not innovation itself[10] (DE6, 2015, p. 2).

As in the previous report, this statement emphasises the importance of teacher attitude, related to the innovation assumptions addressed by Montero and Gewerc (2010), in the sense that personal aspects (like teacher education—itself, theoretical beliefs about teaching, stance in relation to ICT, motivations) influence the pedagogical innovation process.

Two opinions that differ from previous ones are presented below. Asked how he/she perceives innovations, participant DB6 replied:

> I do not. I know they are not restricted to the datashow projector, but in this case I think it has been incorporated already. And as I said, the feeling I have is that it works as a 'crutch' in organising the exhibit, or in dialogue based provocations, but I do not believe they have much impact on learning[11] (DB6, 2015, p. 3, grifo do autor).

Answering the same question, participant DE1 said that his/her perception is one of

> [...] saturation. Innovation and changes may be identified with ICT, but I think the reality of education is broader and more complex than the discourse of 'what should we use to teach' and the technology for that[12] (DE1, 2015, p. 2, grifo do autor).

In these two opinions, it is possible to see a position that gives more importance to the education process itself, considering the use of ICT in teaching as a secondary factor for achieving innovation.

The positions brought forward by these participants are understood to be legitimate.

Participant DE1 considers that 'the reality of education is broader and more complex' than thinking of how to use ICT, while DB6 mentions that ICT is a 'crutch' for him/her to organise teaching strategies. Both cases express the results they identify as arising from the use of ICT in their pedagogical practices. However, 'saturation' or 'non-perception' of innovation may be linked to personal concerns and questions (Martínez, 2008; Montero & Gewerc, 2010), or the possibility of rethinking challenges and building another way of looking at the reality it is set in (Correa et al., 2015). Therefore, the question is how and whether this has been done.

Based on the expressed opinions, it was possible to identify at least three types of perceptions held by participants in relation to pedagogical innovation and changes, arising from the use of ICT in their practices. It may be said that most firmly believe in and identify innovations resulting from the use of ICT. In lesser numbers, there are those who also identify pedagogical practice innovation, but point out that in addition to the use of ICT, they are the result of the teacher's attitude. Furthermore, in an even lesser number, there is the opinion of saturated ICT use, without the perception of innovation.

Obviously, there are several other elements for analysis, in addition to the ones addressed in this paper, which led the studied subjects to take the positions revealed by the data.

Final considerations

The results of this exploratory study present teachers' perceptions on innovation in their pedagogical practices with the use of ICT.

Based on answers provided by the participants, no significant gender differences were identified. Nevertheless, aspects related to characteristics of the subjects taught or geographical issues (each country's educational peculiarities) may have influenced the results obtained.

The results show that there is innovation, to a greater or lesser degree, in pedagogical practices of the studied faculty members, but with room for it to be boosted.

The subjects taking part in the study use ICT at several moments of their teaching practices, showing that there is no resistance, in any of the researched institutions, to the use of ICT.

ICT are used at varied levels. Based on answers provided by some teachers, diverse teaching practices favoured by ICT may be seen; for example, with the use of these resources, some teachers have the perception of innovation by being able to generate new environments that provide other

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[10] Original text: "Creo que en sí mismo no hay innovación por el hecho de utilizar las TIC. La innovación no tiene que ver necesariamente con el uso de TIC: puede que sí pero puede que no. La innovación parte de una actitud docente: el uso de TIC, en su caso, es una consecuencia y un medio de la innovación. No es innovación en sí mismo".

[11] Original text: "Não Percebo. Sei que não estão restritas ao Datashow, mas no caso dele, acho que já está incorporado, e, como disse, a sensação que tenho é que funciona mais como uma "muleta" na organização da exposição, ou de provocações dialogadas, mas não acredito que impactem muito na aprendizagem".

[12] Original text: "[...] saturación. Se identifica innovación y cambio con TIC y creo que la realidad de la educación es más amplia y compleja que el discurso del 'con qué' enseñar y la tecnología para ello."

teaching practices. On the other hand, there are also those who said that they feel that there is a saturated use of ICT in teaching practice. Nonetheless, it is worth mentioning as very positive the fact that the vast majority of participants believe to be involved in innovation processes.

Obviously, the levels of integration and types of uses ICT are put to, vary according to each subject's needs, beliefs and attitudes (underlined by motivational components), but it seems to be clear that, regardless of the teaching strategy adopted, there is a willingness to develop a mediating teaching practice.

Some difficulties on the way leading to pedagogical innovation may be seen. Although innovative teaching practices were identified, moments when creativity – essential aspect for teaching practice – found barriers were reported, which hinder its expression, 'choking' attempts at innovation.

In this study, it can be seen that the discourse made by subjects is reasonably related. The innovation verified through answers to the questionnaires is in part similar to the general explanation about change in education, based on what has been learnt in recent years, supported by the educational scientific literature.

The relationship between innovation expected to favour instrumental conditions introduced in the educational area, and emerging innovation, implicit to ICT itself is observed. The same happens with the relation between innovation expected to be favoured by the teacher's beliefs and the one deemed as emerging, which is the result of attitude.

Therefore, as shown by the study's results, some correspondence is seen between what is known about innovation and what was found on the prospect of innovation with technological resources.

This possible correspondence leads us to reflect on gaps and questions in the discourse of faculty members in relation to innovation with ICT (aspects that may be looked at in future studies), which were identified in a denser analysis of the matter in general.

One of the gaps would be the generation of genuine transformations in school results thanks to ICT, particularly in improvement in high level learning and skills, implied in the competences shown by students. Even so, it is important to note that in the study's general overview, these transformations may be identified in some of the participants' discourse.

A second gap (or absence of) refers to innovation generated by ICT at the institutional level (political, structural, cultural).

Promoting innovation in pedagogical practices is by no means simple, as among other aspects, it implies those related to personal, subjective and institutional issues. Hence, it is important to mention that ICT provide a very wide panorama for the teaching and learning process, but are not the only source of innovation. Indeed, it is up to faculty members to develop pedagogical and teaching based actions in order to reach innovative practice.

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NOTAS:

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