SOCIOLOGICAL APPROACH TO THE USE OF B-LEARNING IN DIGITAL EDUCATION OF UNIVERSITY TEACHERS

Enfoque sociológico del uso del b-learning en la educación digital del docente universitario

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Abstract

B-learning or blended learning is an integrating education program that combines computer-based activities with regular classes. It contributes to the quality of higher education through the improvement of ICT training programs and the development of e-competences in higher education. There has been a literature review of different bibliographic sources related to B-learning and Teaching Professional Development. As a result of this review, it is perceived that E-learning training programs are not efficient enough to face the challenges of blended education, and Blended Learning could be an alternative for teacher online professional development. Based on modern technological societies, b-learning may be an alternative to promote virtual communication of synchronous and asynchronous way, empowering the educational process in social interactions between student-student and student-teacher. University staff is located at the crossroads of being educated digitally in order to improve the educational process in information societies and knowledge. In the face of new digital generation of a society 3.0, it is perceived that formal training in ICT is not sufficient for the development of digital skills in the faculty, and that consideration should be given to a permanent digital training to recover the good daily practices and continuous training with ICTS through the use of Blended Learning or b-learning.

Keywords

Blended program, ICT, Higher education, online professional development.

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Resumen

El b-learning o educación híbrida es una modalidad de aprendizaje integrador que utiliza de manera combinada componentes presenciales y virtuales. Esta modalidad puede contribuir a los sistemas de capacitación y formación digital del docente universitario a través del desarrollo de competencias digitales, con el fin de mejorar los procesos educativos desde un enfoque sociológico. Se ha realizado una revisión de la literatura en diferentes fuentes bibliográficas relacionadas a experiencias y resultados de investigaciones del uso del b-learning para el desarrollo profesional en línea del profesorado universitario. A partir de esta revisión bibliográfica se percibe que los procesos de capacitación en la modalidad E-learning no han sido suficientes para responder a los desafíos de la educación superior en la era digital, y el B-learning se constituye como una alternativa de educación digital del docente en la educación superior. A partir de sociedades contemporáneas mediadas por la tecnología, el b-learning puede ser una alternativa para generar comunicación virtual de manera sincrónica y asincrónica, empoderando el proceso educativo en interacciones sociales entre estudiante-estudiante y estudiante-docente. El docente universitario se encuentra en la encrucijada de educarse digitalmente para mejorar el proceso educativo en sociedades de la información y el l conocimiento. Ante nuevas generaciones digitales de una sociedad 3.0, se percibe que una capacitación formal en TIC no es suficiente para el desarrollo d competencias digitales en el profesorado, y que debería pensarse en una formación digital permanente que recupere las buenas prácticas cotidianas y una formación continua con TIC a través del uso del Blended Learning o b-learning.

Palabras clave

TIC, Educación superior, formación digital, desarrollo profesional en línea.

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Introduction

Faced with the challenges of educational quality in higher education, it has been questioned about the incidence of online teacher training programs in the improvement of educational processes in the university classroom. As Floralba Aguilar (2011, p. 164) affirms, "each pedagogy corresponds to a type of education and to every education a type of technology". As regards the use of ICTs in the classroom, it is perceived that there is a digital divide between the generations of teachers and the new student generations, in which the ICT training programs or systems in teacher education have not proved to be effective responding to the development of methodological strategies and practices with ICT both inside and outside the classroom. Digital technologies offer the opportunity to expand the scope of teaching and learning, moving beyond the frontiers of formal education to multicultural environments (Viteri, 2011).

The university teacher is in the midst of attention and controversy, recognizing a generalized perception of dissatisfaction with the quality of the educational processes, because the contents that are taught do not generate useful knowledge to understand the personal, social and professional life of the individuals (Pérez Gómez, 2010). Today, the teach-

ing profession is facing new challenges and contexts in the information and uncertainty era, and it perceives a generational distance between the teacher and the student that affects contemporary educational processes, since a society of the knowledge and technology that require a pedagogy of cyberspace or teaching-learning theory for the network society (Hermann, 2011).

The central question of the present article is: in what way has the research on Blended Learning and the digital education of university teachers been developed with a sociological approach? The aim of the present work is to review the literature on the use of b-learning and its impact on the digital education of university professors from a sociological perspective. As a presupposition to the approach of this topic, it is necessary to mention the different difficulties of virtual training programs or e-learning for teacher training (Schnerkenberg, 2010), to the point that the effectiveness of e-learning effectiveness has been questioned and the need to look for other teacher training strategies has been considered (Volk and Keller, 2010).

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In addition, the interest of the present article is focused on what has been the advances in research on B-learning, blended learning or hybrid learning, as an alternative for the digital training of university teachers (Güzer and Caner, 2014, Drysdale, Graham, Spring and Halverson, 2013). The work of Halverson, Graham, Spring, Drysdale and Henrie (2014) was used as a starting point for the literary review, which carried out an analysis of the most cited articles in the first decade of research on blended learning.

Sociological approach to the use of b–learning

If we mention the sociological approach to digital teacher training, we should mention Moravec's proposal for a knowmad society constituted by new nomadic generations of knowledge (Moravec, 2013, Cobo and Moravec, 2011). In this sense, contemporary education is facing new challenges, Moravec (2013) mentions that nowadays we live a knowmad society, constituted by new nomadic generations of knowledge, from the development of societies and new challenges in the workplace. It recognizes an evolution of society from the agrarian era or society 1.0, passing through an industrialized society or society 2.0, to reach the society of knowledge and information today or society 3.0. These new generations

of knowmads or nomads of knowledge can work at any time and place, with anyone, before any challenge.

Cobo and Moravec (2011), based on a 3.0 society in which the use of information and communication technologies is privileged, propose invisible learning as an alternative paradigm of inclusive education where informal and non-formal learning is articulated with formal learning. From invisible learning, it is intended to recognize the use of ICT and digital tools in everyday life, where the use of these digital media are no longer learned exclusively in formal spaces, but rather is learned in informal settings, everyday life, in the use of technological mediations of daily living, throughout life. From this reflection, the authors question how a 1.0 university, which has been stuck in the time of agrarian society, can form 3.0 students who belong to the society of the nomads of knowledge and information.

The proposal of a knowmad society and invisible learning invites to understand the new generations or digital natives, and in turn, recognize other informal, non-formal and alternative educational environments mediated by the use of information and communication technologies. Students 3.0 challenge the university 1.0 and the teaching staff to incorporate and develop new digital skills to generate new learning in society 3.0. It is not enough to become familiar with the use and instrumental management of new technologies, but also to incorporate them into processes of creation, innovation and knowledge management as new generation know-how challenges us.

The university teacher is at the crossroads of being digitally trained to improve the educational process in nomadic societies of knowledge. In the face of new digital generations of a society 3.0, it is perceived that formal ICT training is not sufficient for the development of e-competencies or digital competences in the teaching staff, and that a permanent digital training should be considered that recovers good daily practices and a continuous training with ICT (Valverde-Berrocoso, 2011; Valverde-Berrocoso, Garrido and Fernández, 2010; López, 2005). Blended Learning is learning facilitated through the efficient combination of different teaching methods and models and learning styles, and based on a transparent communication of all the areas involved in the course (Heinze and Procter, 2004). Some authors consider this new trend towards mixed learning as a step backwards because they retrieve face-to-face components instead of using virtual education and mention the failure of e-learning (Bartolomé, 2004). Other experts, on the other hand, see it as a novel model that combines the best of each

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modality and improves the quality of the teaching-learning process in different organizational levels of an educational institution and offers several possibilities of making combinations for the formative processes (Llorente and Cabero, 2008, Graham 2004, Bonk and Graham, 2004, Peñalosa, 2013).

In the last 15 years different b-learning models have emerged. Khan (2001) defined an eight-dimensional model that has influenced many e-learning and b-learning designs. These dimensions include institutional elements, management processes, use of technologies, pedagogical criteria, ethical aspects, interface designs, support and support services, as well as evaluation strategies. Shea (2007) developed a hierarchical model based on the beliefs and epistemologies assumed by both the educational institution and the teaching team on the concepts of knowledge and learning. On these assumptions, the educational theories that best explain them are identified, in order to articulate pedagogical approaches and teaching strategies that ultimately shape learning activities in b-learning environments. Garrison, Anderson and Archer (1999) developed the theoretical model called "Community of Inquiry" (CoI), which holds that virtual learning environments, including b-learning, are characterized by three "presences": cognitive, teaching, social. The "teaching presence" refers to pedagogical design and educational practice in a context of collaboration. The "social presence" is detected through communication established in virtual environments and expresses feelings, generates cohesion and openness, necessary to generate learning communities. Finally, "cognitive presence" is the result of a process of exploration, integration and resolution carried out by the student and fostered by teaching practice to generate critical and creative thoughts.

The social presence of the research community provides guidelines for a sociological approach to b-learning. Social presence revolves around the ability of participants to identify with the community, to communicate purposefully in an environment of trust, and to develop interpersonal relationships through the projection of individual personalities. This social presence is projected in communication, synchronic and asynchronous contexts, based on texts, which show affection, openness and social cohesion that allow to develop a sense of belonging in a learning community (Fernández and Valderde-Berrocoso, 2014).

Figure 1
Presence of the Community of Inquiry (CoI)
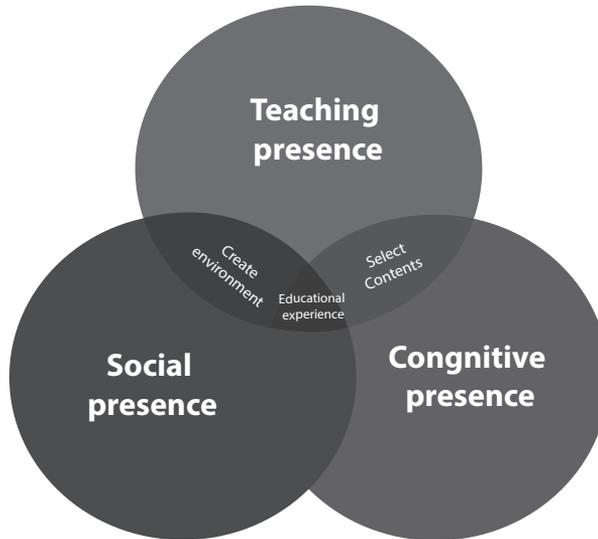
Source: elaborated by the Authors

Recently, Wang et al. (2015) have proposed a re-definition of b-learning under the model of complex adaptive systems, characterized by establishing a dynamic balance between stability and chaos. The five characteristics that define these systems are: (a) the complexity that is observed in their composition in "layers" or "subsystems" that interact in multiple forms; (b) self-organization which implies, on the one hand, an interaction from which new patterns of relationship arise between its elements and, on the other hand, the spontaneous emergence of new structures not imposed by external agents; (c) adaptability, which implies the ability to generate new rules from the combination of previous ones and the new information obtained from the environment; (d) dynamism, an ability to adapt to change that is essential in a system that must be stable but not static, transformative but not chaotic, and (e) ability to co-evolve as a result of interactions between different subsystems and the need to achieve common goals. On this basis, Wang et al. (2015) establish a six-dimensional structure called CABLS (Complex Adaptive Blended Learning System). Figure 2 represents these six subsystems, their components and their complex relationships. The emphasis on interdependence and

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dynamic interaction between subsystems is the difference between this model and the previous ones (Structure of CABLS).

Figure 2
Structure of CABLS (Complex Adaptive Blended Learning System)
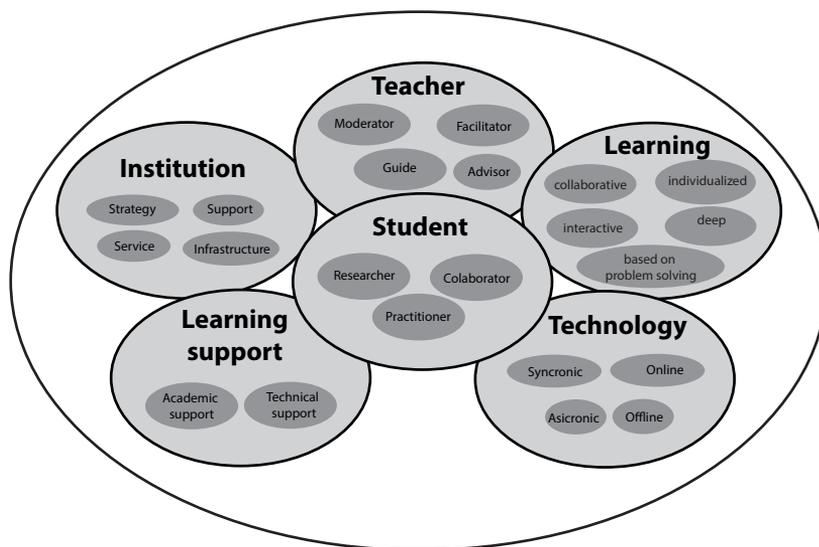
Source: Wang, Han, & Yang, 2015, p. 383
Adapted by: The Authors

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The student in CABLS co-evolves with other subsystems and adopts different identities. Research on b-learning has confirmed the transformation of students into an active role towards their learning, as a result of a process of adaptive and dynamic change by interacting with other subsystems of the multimodal learning environment. Teachers also experience co-evolution, especially as a result of interaction with students and the mediation of digital technologies, generating a complex interaction between educational processes and technological mediation. In this dynamic system, the role of teachers is transformed by the exercise of orientation and personalized tutoring, among others. The learning environments in CABLS favor a great diversity of online and offline methodologies, collaboration, individualization, formal and informal learning, which have made evident the emergence of deep learning through b-learning. The CABLS, given their flexible and adaptable nature, have a more fluid interrelationship with digital technologies. This allows them to update themselves with greater agility to improve the teaching-learn-

ing processes without losing their own structure. On the other hand, due to the basic principle of student-centered learning, support for learning arises from the students' own needs, both academic and technological, which are attended by teachers, supported by technologies (especially communicative) and the support of the educational institution. We conclude that b-learning has evolved towards a new learning system that requires a new generation of teachers and students.

Methodology

The following research questions are posed: What is the range of academic articles that mention the incidence of Blended Learning in digital teacher education? What is the frequency of the relationship between b-learning and digital training of university teachers in impact journals? What is the prospect of research on B-learning and digital university teacher education? Scientific articles on Blended Learning (19), teacher training (10) and online professional development - ODD (17) were investigated. In addition, related articles were investigated between Blended Learning and online professional development -ODP (14), and Blended Learning and university teacher training (14). These articles have been revised in the period 2010-2015 in specialized journals in Educational Technology.

Objective and hypothesis

The purpose of this literary review is to investigate the latest scientific articles that propose the use of b-learning, blended learning or hybrid or mixed learning for the digital education of university teachers. The hypothesis is that the use of b-learning is a modality that can contribute to the improvement of digital teacher education through the development of digital competences of the higher education teacher.

Method

As for the search procedure and selection criteria of the literature on Blended Learning and digital training of university teachers, sources have been investigated in both English and Spanish. For the Anglo-Saxon sources, ERIC (Education Resources Information Center) and other search engines such as Google Scholar and CrossRef were used, and for sources in Spanish, sources such as Google Scholar and Dialnet were used. As for the search criteria, the following keywords were used:

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- *B-learning*: Blended learning, blended program, hybrid learning, e-learning. In Spanish, aprendizaje híbrido, aprendizaje mixto.
- *Educación digital docente*: professional development, online professional development, faculty development, staff devolpment, teaching training. En español, capacitación docente, formación docente, capacitación digital docente, formación digital docente.
- *Educación Superior*: higher education. En español, universidad.
- *Competencias digitales:* e-competencias, competencias en línea.

As for the sources consulted, articles have been taken from scientific journals, both in English and in Spanish, from 2008 to the present date. The selection criteria for the articles include the following:

- Articles were selected which included keywords like Blended Learning, Online Professional Development (OPD); relationship between b-learning and OPD, relationship between b-learning and faculty/teacher professional development, and the relationship between Blended Learning and teacher training. Proposals for other modalities such as E-learning or M-learning were excluded.
- Of the aforementioned articles, only those with a significant impact factor were selected according to specialties in Educational Technology and Teacher Training such as Journal Citation Reports (JCR) and SCImago Journal and Country Rank (SJR).
- Another selection criterion focused on articles that focused on both Blended Learning and digital teacher training in higher education or university teaching. We did not select those articles that reflected experiences at the level of Initial Education, Basic General Education and Highschool (K12).

We found 14 scientific articles in English linking Blended Learning to online professional development (OPD), of which 3 articles from JCR and SJR journals were selected. As for the Blended Learning relationship and teacher training (faculty development, staff development, higher education) as key words, 12 articles and 2 books were found in English, of which 2 articles were selected according to the JCR and SJR rankings.

On the online Professional Development (OPD) keyword that is considered to be close to the definition of digital teacher education in Spanish, 17 scientific articles were found, of which 4 articles were chosen according to the JCR and SJR rankings. Regarding the use of ICT

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for teacher or faculty formation, 7 articles and 3 books in Spanish were found referring to scientific journals written in Spanish. As for the word Blended Learning or Blended program as a single keyword, we found 14 articles and 2 books in English, and 3 articles in English, from which we chose 4 articles in English based on the JCR and SJR rankings. It should be noted that these articles include articles by Halverson and his team on a high-impact analysis of Blended Learning trends in publications and articles from 2000-2011 (Halverson, Graham, Spring and Drysdale, 2012), and the thematic analysis of the most cited articles in the first decade of Blended Learning research (Halverson et al., 2014), research that has served as a starting point for the purpose and hypothesis of this article.

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One of the limitations found in this article is the use of certain databases such as Eric, Google Scholar, CrossRef and Dialnet. For future research will expand the databases to be used as Web of Science, institutional repositories, among others. It is also hoped to enrich this literary review in the future, including related research reports in the field of higher education, university documents related to the proposed theme. Another limitation in this review was to select the appropriate keywords for "digital teacher training" in English. Key words like "online professional development", "staff development", "faculty development" and "teacher professional development" were considered from an approximate translation from Spanish to English. It is considered that the word "training" has a broader dimension than formal training or professional development, since it attempts to include this continuous and invisible learning from the daily experience of the teacher in the development of digital skills.

Results

Blended Learning is projected as a future modality for the improvement of university educational quality (Wold, 2013) and for teacher professional development (Owston, Wideman, Murphy and Lupshenyuk, 2008). In a literature review from 1999 to 2012 on research on Blended Learning, Güzer and Caner indicate that this modality is perceived as useful, pleasant, flexible and motivating for learners, although it has the challenge of generating better learning environments through of social interaction and collaborative work. The study mentions that B-learning has been implemented in recent years in different school settings, including training programs. In the future, studies on hybrid or mixed learning

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will focus on how to create effective or successful experiences in their implementation, and in turn, should consider the inclusion of mobile education (M-learning) using new devices such as tablets, smartphones, among others (Güzer and Caner, 2014).

The study on trend analysis in dissertations and theses on B-learning conducted by Drysdale et al. (2013) considers that one of the tendencies of use of this modality is in the field of professional development. Although this analysis indicates that there is a low percentage in B-learning studies used for professional training (7%), the authors interpret that this result does not reflect the potential of professional development needs, and that future research of B-learning should revolve around the professional needs of administrative and teaching staff in educational institutions (Drysdale et al., 2013, Bicen, Ozdamli and Uzunboylu, 2014). although research in this field has still been incipient in the first decade of research on Blended Learning (Halverson et al., 2014).

Based on a sociological approach, the study by Halverson et al. (2014) on b-learning used variables such as interaction, demographic context and professional development. As for student-content interaction, student-student and student-teacher, there are 14.1% of published articles that reflect the interactions of b-learning. Regarding the use of b-learning for professional development, these authors affirm that it has been a minority tendency (3.5%), as well as research around b-learning and the different demographic contexts (4.7%). In research on other thematic trends in Blended Learning research, such as research on instructional design, learning styles and outcomes, exploration, comparison, technology, among others. Although this study was based on the research published in English language, the thematic tendency of professional development is chosen as the closest or approximate to what is understood in Spanish as formation or training.

Within the institutional variables in education as critical factors in the success of b-learning, Valverde-Berrocoso mentions the ability to implement more flexible organizational structures in universities. Within this organizational structure, teacher training should be considered or teachers should be supported (Valverde-Berrocoso, 2011). In this way, B-learning becomes an alternative modality for the improvement of the teaching-learning processes and a trend in the use of ICT for university teaching (Valverde-Berrocoso, López, Garrido and Díaz, 2004). This modality is considered as suitable for the professional development of students of training for teaching (Fainholc, 2008).

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Faced with the generational gap between the use of technologies and the generation of knowledge in our contemporary societies, the need for a digital education of the university teacher, which includes not only the instrumental use of information and communication technologies through the teacher "office-matization"[1], but also through the development of digital skills in which learning is generated, knowledge is managed and competences are developed for the general field, through a "digital education"[2] of the teacher, in that teachers be able to be an educator capable of promoting science and technology in students in function of the development of digital competences (Regalado, 2013). From this perspective, some research results are presented on Blended Learning and its impact on the digital education of university teaching staff.

The development of digital competencies or informational capacities (Valverde-Berrocoso, 2011) should be based not only on training, but also on the daily use of ICTs (Valverde-Berrocoso et al., 2010) and incentives offered by Institutions such as prizes for good practices in the use of ICTs or expansion of virtual or distance careers (Schnerkenberg, 2010). Training programs or certification in use of ICT should include web 2.0 resources for higher education, as well as tools for e-research and e-science for university teachers, as well as assess the importance of reflexive learning methods for the acquisition of e-competencies (Volk and Keller, 2010).

The latest research also agrees that higher education institutions are challenged to increase the number of teachers who can teach online or use blended learning to organize learning through quick and effective teacher training strategies, that lead to immediate practical results (Gregory and Salmon, 2013). Although university teachers still have difficulties in incorporating technology into the classroom, there is an increase in the interest of articulating technology with content, pedagogy and knowledge (Rienties, Brouwer and Lygo-Baker, 2013). There are also studies on successful experiences in teacher candidates where the results in the development of multimedia projects gave better results in groups that used Blended Learning to contact face-to-face and online with their peers and instructors (Bicen et al., 2014) or to form mixed communities or hybrid (blended communities) for the professional development of the teacher (Matzat, 2013).

A social approach to b-learning promotes hybrid learning from problems. Therefore, one of the horizons for research on Blended Learning and digital teacher training is found in Blended Problem-Based Learning (Blended PBL), which will allow future analysis for professional development of the university teacher (Donnelly, 2010). In turn, Blended

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Learning provides an excellent opportunity for them to learn on the job, interacting, sharing and communicating with other faculty members, and in turn improving classroom practices and learning for their students (Owston et al., 2008).

The creation of innovative portfolios that include both formal and non-formal information on teacher education and the development of learning communities among teachers can be an alternative for the development of digital skills. The teaching portfolio is presented as a tool for reflection, continuous improvement of teaching practices and the development of competencies, as well as the socialization of the achievements and results of teaching (Seldin, 2011). In this way the development of digital competencies of the teacher will not depend exclusively on formal training but also on non-formal and informal training.

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Discussion and conclusions

Given a digital context in university education, it is possible to conclude that it is necessary to think and rethink the ICT teacher training models towards a continuous, synchronic and asynchronous digital training, formal and non-formal, face-to-face and virtual, autonomous and collaborative of the faculty. This digital training should seek the development of e-competences or digital competences for the ICT practices of university teachers both inside and outside the classroom (Gregory and Salmon, 2013). The use of Blended Learning as an effective modality for teacher professional development is relevant to the promotion of digital competences in order to improve teaching strategies through the use of information and communication technologies (Owston et al., 2008 Wold, 2013, Drysdale et al., 2013, Halverson et al., 2014).

Blended Learning can be an alternative of integrating ICT in professional teacher development not only as information and communication technologies, but also as technologies for knowledge management and learning (Güzer and Caner, 2014). The use of Information Technology and Education in higher education allows to improve the learning of university students, considering that these new technologies of information and communication are part of everyday life. Their forms of interrelation, knowledge management, thought development, and behaviors are mediated by the use of ICT (Valverde-Berrocoso et al., 2004), which implies the study and analysis of new modalities to achieve meaningful, strategic and relevant, and even more, the university teacher has as challenge to insert in

this new digital logic and to look for alternative spaces and programs for their digital education and training (Pérez Gómez, 2010).

The digital education of university faculty is a challenge for university teachers in the face of the dizzying advance of technology. For this reason, Blended Learning is considered as an alternative for the development of digital competences of the teacher, from the presence of a formal training course, to the synchronous and asynchronous use of digital tools that complement digital training (Regalado, 2013). At the same time, the use of Blended Learning can be an alternative of digital training in countries where levels of connectivity are still incipient or limited: face-to-face can complement the digital education of the university professor.

Notes

1   We mention an "Office-matization" as a term that identifies training processes in which the teacher learns the operational use of traditional office tools, such as Word or Writer, Excel or Calc, Powerpoint or Impress.
2   We use the term "digital education" to identify digital training and training processes in which the university teacher develops digital competences, implements methodological strategies with ICT in the classroom.

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