



## New Ways of Learning: Teacher Training in the Use of ICTs

### Nuevas formas de aprender: La formación docente frente al uso de las TIC

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## Summary

Information and communication technologies (ICTs) have become a decisive resource in the field of education, and at the same time, an indispensable variable in the academic practice where we seek to use each one of the resources offered by Web 2.0. The objective of this article is to perform a critical analysis and review of the conceptual aspects of teacher training, the use of the ICTs and their implications in teacher's daily work, as well as in the teaching-learning process. Finally, it is concluded to highlight the importance of the creation of pedagogical dimensions that indicate the training competencies a teacher must have given the new technological tendency.

**Keywords:** Teacher training; ICT; learning; pedagogical knowledge

## Resumen

Las tecnologías de la información y comunicación (TIC), se han convertido en un recurso determinante en el campo educativo, y a la vez una variable indispensable en la práctica académica donde se busca aprovechar cada uno de los recursos que nos ofrece la Web 2.0. El objetivo de este artículo es realizar un análisis y revisión crítica de los aspectos conceptuales frente a la formación del docente, en el uso de las TIC y su implicancia en su labor diaria, así como en el proceso de enseñanza-aprendizaje. Se concluye en resaltar la importancia de la creación de dimensiones pedagógicas que señalen las competencias de formación, que debe presentar un docente, frente a la nueva tendencia tecnológica.

**Palabras clave:** Formación docente; TIC; aprendizaje; conocimiento pedagógico.

## Introduction

The origin of the Information and Communication Technology (ICT) dates back to the arrival of computers and the internet, which led to have easy access to information, giving rise to the increasing and important technological society. From a historical perspective, technological revolution has marked a decisive “breaking point” in the world society, and its impact on the human life, which supposes a qualitative change in the way the man think about his relationships with his peers and the redefinition of the acquisition of new knowledge. Thus, the ICTs are understood as an external agent that generates knowledge; redefining the models of relationship, processing and communication of information.

Nowadays, the use of the ICTs is widely extended causing changes in the last decades in different aspects of the human life. According to Jacovkis (2012), the ITCs have caused a profound impact on the whole world, on science and technology, and consequently, on society. The UNESCO (1998) states that the rapid progress of the ICTs modifies the way to prepare, acquire and transmit knowledge. These changes and modifications have impact on the economy, society, politics and culture; and they transform the human being into a being more and more creative, critical, autonomous, in search of acquiring new competencies for their proper performance in a context that is more variable and uncertain every day. Therefore, according to Cornella (2000), societies of knowledge are organizations and people who face the need to manage the information efficiently.

Cabero (2007) says that the ICTs, within the new contexts, are essential elements in the interaction of individuals. Likewise, Carneiro, Toscano and Díaz(sf) agree with the idea above mentioned by indicating that the accelerated development of the society of information supposes new challenges for education and learning. These last two definitions start a new challenge in the field of education, where knowledge and the use of ITCs redesign, in the student and in every agent around him, the preparation, training and

the proper use of them as pedagogical tools that can be used as educational accompaniment instrument by the students. The new technologies generate diverse methodologies, causing changes in their didactic and pedagogical use. In this field, tools that will make it possible the analysis, reflection and study of the coupling of education and technology are generated (Cabero, 2007).

The use of technology in education has allowed the flexibility and adaptability of students become a tool of interaction and ease of use in learning. However, the way in which technology has been applied in education has been changing with every advance, allowing more efficiency and use of educational resources for the optimization of the teaching-learning process. According to Fernández (2001), the presence of new technologies requires a profound reflection in search of educational improvements and their adaptation to the daily educational life. Therefore, these technologies have caused a change in education, both in users participating in it and the scenarios where learning takes place (Domínguez, 2004).

It is quite clear that great strides are being made in relation to the incorporation of technologies in educational institutions. Since the last century, a strong technological revolution has been experienced, facilitating the access to information desired as a consequence of the coexistence between man and the new technological devices. For that reason, it is necessary to be able to study this simple or very complex interaction.

From this perspective, education, as the motor of development and social change, must train a human being that meets the characteristics required for the real society. With respect to the foregoing, Escudero (1992) says that it is necessary to integrate new technologies into a new well-founded educational program to make a pedagogical use of them, since they the goals, objectives and methodology provide a new educational sense. The advance of technology and its growing incorporation in education have made classrooms begin to assume a new important role of transformation. According to Coll, Mauri and Onrubia (2008), the impact of the ICT on the

educational process has increased progressively, in parallel with the growing incorporation of these technologies in all teaching levels. Therefore, De la Torre and Domínguez, (2012) say that the Teaching-Learning Process (TLP) in our times has as a purpose to contribute to the training of the student by fulfilling the instructional and educational objectives. Kay and Knaack (2009) propose that the TLP supported with the ICTs facilitates teaching and learning more than the traditional means such as books and television, among others.

The adaption of society, in relation to education, leads to the development of ways that can integrate the ICTs into training processes. Irigoyen, Jiménez and Acuña (2001) conceive higher education as the training that involves models based on an idea of learning contents, and this conception is being modified due to the accelerated change of knowledge. The need for adaptation in this context impacts on the idea of change, of students as users and of the teacher's role. All of this implies, in turn, changes to teaching-learning models towards an implicitly flexible model within the framework of an innovation process (Salinas, 2004).

In this context the teacher develops a series of contingencies of reinforcement and control of stimuli to teach. Then it is about the proper use of technological resources to get better levels of efficacy in teaching and successful learning of their students. (Guerreo & Faro, 2012). According to Domínguez (2004), nowadays the interest in ICTs production in the education system can be observed by knowing the basic teaching training and their implication in the knowledge acquisition.

Every educational innovation or improvement requires teachers to play an active role during their implementation. These educational innovations and improvements cannot always be easily incorporated. Marqués (2004) states that the ICTs have become a cross curricular theme of every training activity and they will always have a triple function: (1) as an instrument that facilitates the learning processes, (2) as a tool for the information process and (3) as an implicit content of learning. Izquierdo and Pardo (2007) say

that the use of the ICTs in the educational process and especially in higher education has evidenced the need to transform the methodological work and the training of teachers and other individuals that participate in such process, so that they can face challenges that the current society needs in terms of training of professionals. In other words, the level of use of ICTs influences the impact they can have on the TLP. It is concluded that nowadays, teachers need to use the ICTs in many of their usual professional activities to improve their educational work. But, what happen when the teacher is not persuaded or trained to carry out such activities? Resistance based on disinterest, disinformation or prejudices can invalidate any attempt to improve education. Consequently, the idea of a teacher giving master classes to their passive students had to be reconsidered to focus on training aimed at students, in which the students play a more active role, using interactive means, there is more a collaborative learning relationship.

From this perspective, it is intended to carry out a systematic review of the attitudes and pedagogical knowledge as those variables that influence the teaching training process and their impact on the student. The attitudes as a concept reflect the importance of the psychological functioning of the human being, both in his labor and educational insertion. Ferreira (2009) says that an attitude is a tendency to action learnt in the environment where ones lives and derives from personal experiences; it is here where what promotes the behavior becomes part of a system of representation of the reality. Although the concept of attitude is still very difficult to define, since as stated by Dawes (1975), it is easier to measure the attitudes than to define them. According to Hollander (2000), attitudes are perceptions about people, things or environmental facts, and insofar as they guide behavior, they have motivational qualities. He also says that this concept is associated with the variable called “values”. In this context, teacher attitudes seek to contribute to the educational practices in terms of training and use of tools, as well as the didactic use of them.

## **Pedagogical Knowledge in the face of the ICTs**

The pedagogical knowledge is related to the knowledge to educate for a type of society. In this regard, three aspects of this type of knowledge are described: theoretical, practical and critical. The first one seeks to identify the educational phenomena; the second one implies acting to empower the person and society and the third one substantiates the educational practice; it is also a critical reflection on the pedagogical practice. Touriñan (1988) seeks to understand and master education through the components of the educational phenomenon that must be understood to know such phenomenon. The studies about the teacher's knowledge have become a productive field of research, the initial and ongoing teacher training are analyzed according to knowledge and interactive teaching. (Schubert, Medina & do Prado, 2011)

If we associate the foregoing with the educational context, the interest is in the teacher training in employment and adaptability to these new technologies and their impact on TLP. It is here where the role of the teacher becomes more important since the teacher is considered as a mediator of learning, respecting and evaluating the new challenges in the face of an education in the era of knowledge.

The teaching processes must lead to a serious reflection of the teacher, which not always occurs, on the importance of having knowledge of how ICTs should be properly used to achieve a true integration in education. Therefore, there must be a change in the conception of their use in relation to why to use them.

Twining, (2002) in this context, and to try to understand the impact of the ICTs on education, has strongly raised the need to empirically study the way in which teachers and students use these new technologies in the real development of practices carried out in class, considering evaluating the way in which teacher training processes are conducted in the face of the new changes and the attitude towards assuming more responsibilities.



The foregoing help to define a teacher's profile, flexible and variant and able to adapt to the continuous changes in our society (Bozu & Canto, 2009). Thus, the role of the teacher varies with the new ways of relationship with students and their learning environment. The scenarios where classes take place become more important based on the use of new technologies (Llorente, Cabero & Barroso, 2015).

Pedagogical knowledge refers to the fact that a teacher could use pedagogical activities, the processes and practices of the teaching method and how they are related to thinking. (Cabero Almenara, Marín Díaz, & Castaño Garrido, 2015). Their use allows the participation and performance of tasks adjusted to the needs and interests of the students (Fernández Batanero, & Rodríguez Martín, 2017).

Although the ITCs can be considered an efficient tool to improve the education of students, it is necessary to transform the teachers' performance, since learning is related to the quality of the practices in the classroom (Coll, Mauri, and Onrubia, 2008). During the last years, the problem about training teachers in ICTs and the competencies they need to use them (Fernández-Batanero and Bermejo, 2012; Rosario and Vázquez, 2012; Ortiz, Almazán, Peñaherrera, and Cachón, 2014; Rangel, 2015) has been mentioned. One of the challenges in this society of knowledge is to incorporate the teacher training, new competencies that involve the use of ICTs in teaching and learning, integrating these aspects into the achievement of pedagogical objectives.

Teacher training and the acquisition of knowledge for a good practice and use of ICTs in the classroom, coincide with the Cabero's proposal (2004; 2008; 2014):

**Table 1.** Knowledge acquired and formed with ICTs.

Training/Knowledge	Characteristics
Instrumental	Minimum competencies for the instrumental use of different ICTs
Semiological/aesthetic	Decoding messages that ICTs use
Curriculum	The ICTs are a mean to achieve the curriculum objectives set.
Pragmatic	The different actions that are proposed when using the ICTs allow obtaining a series of differentiated sociocognitive products.
Psychological	The ICTs develop specific cognitive skills, they become a teaching-learning resource.
Producer/Designer:	The teacher must become a producer of ICTs. The beginning is marked by the consumerism. However, the ideal of production must be achieved.
Selection/evaluation:	The teacher should become a <i>content curator</i> , typical of a selection and evaluation of ICTs.
Criticism	It is realistic resource that makes the education be aligned to the perspective of the new society of knowledge.
Organizational	There is not only one resource, the ICTs show us a variety of strategies that will allow the teacher to organize the contents for better results.
	The ITCs become an allied resource for the teacher, and the creation of new training spaces, denying rejection and permanent submission.
Research	It becomes a resource to obtain results.
Communicative	Different models of synchronic and asynchronous communication are established, creating different scenarios of communication with the ITCs.

## Conclusions

The ICTs integration into the educational field depends on several characteristics, which as a whole, will favor the teaching methodology. The pedagogical knowledge is a determinant value in the teaching process. However, the socioemotional aspect, perceptions and attitudes, the teachers have with respect to these means of communication will be determinant factors when using and integrating them into educational processes.

Currently, teacher conceives the use of ICTs as a challenge and the update of these processes leads to improve the educational practice (Álvarez, et al. 2011). This outlook allows changing the traditional education and also

allows the teacher to adapt to the change and become the predominant agent of these new resources.

The integration of the ICTs into the training field is going through a substantial change where these resources and the image of the teacher are conceived as a learning facilitator, where the ICTs are an element of support to revitalize the learning process (Marín & Romero 2009). This requires a set of competencies that the teacher must acquire to create a methodology that allows the use of technological tools, in which the teacher training should be considered one of the first options before facing the new educational challenges (Hernández, 2017).

This new challenge of acquiring pedagogical knowledge related to ICTs is experienced in the university training of the future teacher. Marín and Romero (2009) indicate that communication and creativity and change management have become three disciplines that will mark the future of today's university education.

These new proposal for teacher training in ICTs and the acquisition of pedagogical knowledge for the use of these resources indicate that the teacher should have competencies in different dimensions, which will allow the objective use of the ICTs and their possible adaptation to the educational characteristics that they want to teach.

The teacher training must be comprehensive from a perspective that integrates technology as a resources for teaching and the student learning obtained, and this leads to the training of a teacher with reflective, constructivist and evaluative approach to obtaining new products. However, the expansion of the ITCs in our society shows a series of limitations with technical, safety problems and economic and cultural limitations (Marín & Romero, 2009). However, this should not be a limitation for the teacher training to continue increasing the search for new alternatives of learning with technological resources.

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