

Usos y actitudes de los formadores de docentes ante las TIC. Entre lo recomendable y la realidad de las aulas

Teachers trainner's uses and attitudes before ICT. Between the advisable and the reality of classrooms

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RESUMEN

Palabras clave

TIC, actitudes, formación docente, competencias digitales

Este trabajo contiene el análisis de la manera en que una universidad formadora de docentes en México utiliza las tecnologías de la información y la comunicación (TIC) y las actitudes de los docentes hacia ellas, de acuerdo con el reto que plantea la Estrategia Digital Nacional (EDN, 2013) de formar a las nuevas generaciones de maestros en el uso y la aplicación de estas herramientas. El estudio se centra en la Universidad Pedagógica Nacional y en la potencialidad de la institución para responder a las necesidades vigentes en materia de TIC. El enfoque es de corte cuantitativo a partir de la aplicación de una encuesta, la cual incluyó una muestra aleatoria que alcanzó una confianza de 90%. Los resultados revelan que los recursos tecnológicos que han sido mayormente incorporados al aula son el correo electrónico y el PowerPoint, y quedan muy por debajo los recursos asociados a la Web 2.0, como los wikis, blogs o las plataformas Moodle o *classroom*. Esta investigación aporta evidencia sobre los usos de las TIC en una escuela formadora de docentes y ofrece una idea de la distancia entre lo recomendable en el desarrollo de competencias digitales y la realidad de las aulas.

ABSTRACT

Keywords

ICT, attitudes, teachers training, e-skills

In this article it's analyzed the ways professors use ICT in a teacher trainer university in Mexico and the attitudes of each professor when they are applying them in the classroom, taking as a reference the goal from the Digital National Strategy (2013), which consists of training new teacher's generations by using this newcomer tools. The analysis is centered in the National University of Education Science (UPN), and its potential to answer for needs regarding the ICT uses. The research is quantitative; the survey included a random sample that obtained with 90% of reliance. In the results it is identify the e-mail and the PowerPoint tool as the most common in a classroom; on the other hand the Web 2.0 tools just like wikis and blogs are the less popular in a classroom. The research presents evidence of the basic use of ICT in the teacher's training school and adds an idea of the distance between the advisable and the reality in the classrooms.

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INTRODUCTION

The accelerated development of ICTs in our century has prompted the governments of different nations to create, design and implement public policies that allow societies and the population in general, to insert themselves into what has been called the society of information and knowledge. Mexico is no exception, since the emergence of ICTs has represented a real challenge in trying to take advantage of the potential of these tools and seeking to lead its citizens in the direction demanded by the current century.

Within this framework, the Mexican government promoted the EDN (2013) [Spanish acronym for the National Digital Strategy], which establishes as one of its objectives to "Develop a national policy to adopt and use ICTs in the teaching-learning process of the National Education System" (p. 18) and proposes the following course of action:

- Provide ICT infrastructure to all schools in the education system.
- Expand digital skills among students through pedagogical practices.
- Create digital content aligned with the curricular plans and promote the assessment of these plans with the aim of incorporating ICTs.
- Incorporate ICTs to teacher education as an everyday tool and teaching tool.

This research focuses on the last point: how ICTs are incorporated into the teacher training as an everyday tool and in teaching. It is worth mentioning that there are 261 teachers colleges in the Mexican Republic, according to the General Directorate of Higher Education for Professionals in Education (SIBEN, 2016), and eleven of them are located in Jalisco. 71 UPN [Spanish acronym for National Pedagogical University] schools also operate throughout the territory (Ministry of Public Education, 2015) and five are in Jalisco; there are also others of a private nature that are dedicated to teacher training. Despite this large number, it is not clear what the current teacher training schools are doing to include ICTs in their educational practices and to instruct new generations of teachers in using them.

The concern about the use of technologies in education is not a recent issue; there have been previous efforts to equip and include them into the classrooms; for example, Computers in Basic Education (COEEBA, 1986 [Spanish acronym for Computer Project in Basic Education]), Educational Television Network (EDUSAT Network, 1995 [Spanish acronym for Educational Television System]), School Network (1999), Encyclomedia (EM, 2000), Digital Skills for All (HDT, 2007 [Spanish acronym]) and recently, the Mi Compu mx program (2013). However, implementation programs have not suffice, either because the computers or software expire or become obsolete, which causes new technologies to

replace the previous ones, or either it is because the equipment are not sufficient or they are badly distributed.

To continue with these policies, the government of the Republic, through the EDN [Spanish acronym for the National Digital Strategy], has made efforts to provide infrastructure to schools by delivering laptops and tablets to students of grades 5 and 6 of primary school throughout the national territory. It has also implemented the Connected Mexico strategy, through which educational institutions have free access to the Internet; the government, with these measures, has sought to make progress in providing schools with sufficient infrastructure.

However, and with all due respect to the course of action aiming at expanding the students' digital skills and incorporating ICTs to teacher training as an everyday tool and teaching, the efforts have not suffice. There is little research done on this topic; those we have found refer mostly to the use and incorporation of Enciclomedia (EM) to the educational practices. Loredó, García and Alvarado (2010) conducted a study in Mexico City on good practices with ICTs and they interviewed 127 teachers of the 5th and 6th grades of primary school; subsequently, they carried out a sampling and selected thirteen of them who complied with a good use of EM: good command of the program, planning of their classes taking into account the tools and contents, and more than a year using the program. However, their results showed that most of them used textbooks as primary resource and, secondly, the EM program, which is used as a repository of learning content, search tools and information selection.

On the other hand, Eudave and Carbajal (2011) carried out an enquiry in two primary schools and two high schools in the State of Aguascalientes. They report the problems or difficulties in incorporating ICTs in educational practices, the lack of training or scarce training, the lack of training regarding the didactic bases on the use of ICTs, the lack of technical support, in addition to the little time and space to start collegiate projects. In another study, Castañeda, Carrillo and Quintero (2013) developed an ethnographic work in two schools in Durango, one urban and one rural. Their results show that teachers do not incorporate EM into their school planning or modify their everyday classroom practices; they point as obstacle, the delayed and incorrect software training, or the lack of it.

Santiago *et al.* (2013) analyzed the strategies used by teachers when using EM and HDT. The research was ethnographic and gathers experiences from the states of Nayarit, Aguascalientes, Puebla and Veracruz. They found that the teacher propitiates the interaction with the program, that an individual rather than a collective format is used, and that the teacher also directs and guides the use of ICTs. Therefore, they conclude that a traditional use of ICTs prevails. In the final report on the HDT program, the assessors considered that "... directors and teachers,

rather than being trained, must receive permanent support very close to their reality, a purpose that is achieved with the accompaniment that includes training related to the HDT program, the certification and counseling, both pedagogical and technological "(SEP, 2012, p.78 [Acronym for the Ministry of Public Education]).

Si bien encontramos varios estudios, la mayoría de ellos se enfocan al programa EM y pocos o muy escasos se encargan de estudiar las nuevas generaciones de tecnologías; esto es importante porque el programa EM como proyecto de integración de las TIC ha dejado de funcionar. En los resultados identificamos un gran error respecto a este programa, como el hecho de que los profesores no podían utilizar EM fuera del aula; había poco tiempo para explorarlo, planear las clases y aprender de él.

Even though we found several studies, most of them focus on the EM program and few or very few study the new generations of technologies; this is important because the EM program as an ICT integration project has stopped working. Our results showed that this program had several issues; the teachers could not use EM outside the classroom and they had little time to explore the program, let alone plan classes and learn from it.

The new technological generations have focused more on equipping students and teachers with personal equipment without knowing very well what advantages these projects have had on the educational practice. Moreover, most of the research is carried out in educational centers and not in teacher training schools; as Vaillant (2013) points out: "The subject matter of teacher trainers in universities and training institutes is rather an unexplained and unexplored territory and its reflection spaces are almost non-existent in the Latin American pedagogical bibliography" (page 35).

Digital Competences and Teacher Training

There is a general consensus on the necessity to train teachers in technologies that allow both their technical and didactic mastery in order to include them in curricular planning and teaching. EDN [Spanish acronym for the National Digital Strategy] makes a reference to this in line 4, that seeks to: "Incorporate ICTs in teacher training as an everyday tool and in teaching" (Government of the Mexican Republic, p.22); nevertheless, the scenario of the educational reform in Mexico has raised new dynamics until now unpublished in the educational field; in light of the foregoing, the teachers have focused their interest in knowing, understanding and preparing for the educational reform, and have left in second place or have simply postponed educating themselves in the field of ICTs.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) consider that training in technological competences is not isolated from the school institution and the pedagogical training of

teachers (Díaz-Barriga, Padilla & Morán, 2009). In fact, the teacher alone cannot generate changes on his own; he also needs the dynamics of the educational institution itself to lead innovation and improvement projects. In this sense, the recent reorganization of school directors and their appointment through contest can be a scenario in favor of Mexican schools and the momentum for ICTs. It is necessary to propose training and permanent training programs, even more so when we know that the development of competences is linked to the teachers' perception of their mastery of technologies. It has also been found that teachers show greater stress in using ICTs and feel less competent in comparison to students (Coll, cited in Díaz-Barriga, Padilla & Morán, 2009).

According to UNESCO, the acquisition of competences requires an integrated history of development at three levels:

- ICTs basic notions. This implies encouraging teachers to acquire basic ICTs skills by teachers in order to integrate the use of basic tools in the curriculum, pedagogy and classroom structure.
- Deepening knowledge. It is expected that teachers will be provided with the necessary skills to use more sophisticated didactic methodologies together with ICTs, and highlight the understanding of school knowledge and, above all, its application to real-world problems as well as to its own pedagogical approach.
- Creation of knowledge. It is expected to increase the capacity to innovate, produce new knowledge and take advantage of it, as well as to promote civic participation, cultural creativity and economic productivity (cited in Díaz-Barriga *et al.*, 2009, pp. 76-77).

In regard to digital competences, Morales (2013) summarizes, from the literature, the skills a teacher must possess:

- Have a positive attitude toward ICTs.
- Know the uses of ICTs in the educational setting.
- Know ICTs in his field or area of knowledge.
- Skillfully use ICTs in his activities: text edition, e-mail and Internet browsing.
- Acquire the habit of planning the curriculum by integrating ICTs.
- Propose training activities to students who consider using ICTs.
- Permanently assess the use of ICTs.

According to the foregoing, the use and integration of ICTs requires positive attitudes and a step from knowledge to the consistent and sustained application of the tools in the professionalization of work. The Mexican educational scene shows signs of change that can be used to achieve the Millennium goals.

Teachers' Attitudes toward ICTs

According to Orellana *et al.* (2004), most studies addressing the integration of ICTs include a section on the attitude of the teaching staff, which, as they point out, predict the incorporation of ICTs in schools. Ramírez, Cañedo and Clemente (2012) argue that the teachers' beliefs play an important role in revealing what teachers do in their practices. Likewise, studying teachers' beliefs about ICTs is crucial to explain the processes of their use in the classroom.

On the other hand, Gómez and Cano (2011) point out that the analysis of educational thinking is a way to understand the integration processes of ICTs in the classrooms; for the latter, behaviors can, "also, feedback beliefs through a self-attribution procedure, in such a way that the educational thoughts, behaviors in the classroom and school situation influence each other mutually in a reciprocal process" (p. 7).

Hervas and Martín consider that beliefs "represent the educational conceptions of teachers in training, which will organize and structure their professional world, while influencing their actions and decisions" (cited in Gómez & Cano, 2011, p. 73).

Studies on the relationship between attitudes and ICTs integration, show that the beliefs teachers have about their own teaching effectiveness are linked to their educational practice. In this sense, a positive perception of digital competences and favorable attitudes are prerequisites for the integration of ICTs into the classroom (Ramírez *et al.*, 2012). Thus, there is a positive association between training in ICTs and more favorable attitudes toward them.

Gilmore mentions that "it was proven that the attitudes of teachers who had received training improved significantly in comparison to the group of teachers that did not receive such training" (cited in Orellana *et al.*, 2004, pp. 1-9). It is thus, "a very important differential variable, a greater competition and better attitude toward ICTs". Gómez and Cano (2011) take up the idea of technological self-efficacy as "a perception of one of their abilities in regard to specific computer skills and knowledge" (p.10) and consider that perceptions can be positive or negative; when they are positive, they can help the teacher transition from a traditional role to a more active one in which technologies are at the center to support the student's learning, while negative perceptions can include resistance from the teachers to modify their role as teachers, i.e., it is understood as a resistance to change.

Ramírez *et al.* (2012) have found positive attitudes toward ICTs but they have also identified that these do not suffice to integrate them into educational practices. It is necessary to create conditions to achieve this

process. Therefore, the teachers declared having a more positive attitude when the computers are in the classroom. Likewise, attitudes were more positive when teachers had the Internet and computer at home. When these elements are present, the interest and the integration of ICTs into the educational practices increase.

Gómez and Cano (2011) acknowledge that the teaching styles also interfere with the integration of ICTs. Teachers who use constructivist teaching model have the greater tendency to integrate ICTs in their practice while, those that use a traditional teaching model prefer a more personal relation between the person mastering the contents (the teacher) and the student. Lastly, teachers with mixed thinking use a greater variety of technological resources given the mixture of educational styles.

Ultimately, perceptions or beliefs, according to the literature, are a crucial factor, since they allow or restrict the entry of computers into the classroom. Therefore, encouraging a positive attitude is fundamental to implementing changes and innovations in schools. However, modifying the teachers' beliefs about ICTS and their role means deconstructing the bases on which teachers move, act and give meaning to what they teach and their educational practice.

PROBLEM STATEMENT

Given the scarcity of research on teacher training schools, it is important and urgent to enquire what these institutions are doing to train new generations of teachers. In this context, the UPN is known to train teachers. Said training includes several programs that highlight the transformation of the educational practice, such as Masters Degrees in Basic Education and in Education, as well as the incorporation of pedagogical skills, such as the doctoral studies in Regional Development. Moreover, UPN also offers a Bachelor's degree in Educational Intervention addressing high school graduates. In an educational institution of this nature, where educational innovation is part of the mission of the institution and pedagogy its core, it is natural to be concerned about training the future professionals in education in using ICTs and to think of more innovative ways in using and integrating them as part of the preparation of teachers who attend their classrooms.

In response to the need to incorporate ICTs, the UPN has made efforts to hire professors who meet the ICTs use profile in order to manage new technologies. Hence, the UPN has managed to promote the development of the University's website, online courses as support for the teaching-learning processes, the use of Facebook as a support for the communication between students and the

University and, in general, train the teachers in using new technologies. Furthermore, as of 2010, the UPN has created the Coordination for the Learning of Technologies, which has promoted the use of technologies.

The objective of this study is to enquire how often teachers of the UPN Guadalajara Unit resort to ICTs in their educational practice. To do so, we took into consideration the teachers' leading role as educational trainers of teachers and their specialization in the field of pedagogy. We wanted to know if teachers made a didactic and innovative use of the tools in the classroom and how they perceived them. The central questions were: what are the uses teachers trainers make of ICTs? and, what perceptions do these trainers have about ICTs in the classroom?

METHODOLOGICAL DESIGN

Our research is quantitative, transversal and descriptive since "it seeks to specify the properties, characteristics and profiles of people, groups, communities, processes, objects or any other phenomenon that undergoes an analysis" (Hernández, Collado & Baptista, 2015, p.85). According to Aldridge and Levine (2003), a survey is not only a research technique, but an effective social analysis strategy that seeks to obtain "the same information from all the cases included in a sample" (page 20).

We gathered the information by using a questionnaire designed by the Knowledge Society and Internationalization, an academic body belonging to the University of Guadalajara. The questionnaire was adapted to the context of the UPN. It is a questionnaire of closed reagents, applied electronically through the SurveyMonkey platform, which included four sections: general data, teacher training, educational practices and attitudes toward ICTs. We used a five-item scale: very good, good, satisfactory, poor and no use, in addition to others such as: very frequent, frequent, rarely and no use; we also used open type questions.

A total of 59 teachers of the Guadalajara Unit participated in this study. Age wise, 19% are between the age of 41 and 45, 16%, between 36 and 40, and the most relevant between 61 and 65. In regard to their seniority, 29% are relatively newcomers, since they have been teaching for 0 to 5 years; 20%, from 6 to 10, which gives us an idea of the renewal of the teaching staff; and 15%, from 26 to 30. Most of them are tenured professors (29%); 27% are fulltime professors and 15% part-time professors; of the 59 participants, 29% did not answer.

The sample consisted in a total of 34 teachers. The degree of confidence was of 90% and the margin of error of 10%, which is valid for social studies. In regard to the validity of the instrument, we applied the Cronbach's alpha test, with a result of 0.877, which is valid to indicate the strength and coherence of the questions posed in the questionnaire.

The data analysis consisted in applying the frequency obtained in each of the items considered. The frequency analysis is represented with the percentage expressed in the use of the technologies, in their didactic use and in the teachers' perceptions of ICTs. Likewise, we contrasted these results with the literature reviewed in order to find explanations that would guide the answer to our research questions.

RESULTS

The results are divided in three sections. The first addresses the aspects related to the use and mastery of ICTs; the second, the use of ICTs in the teaching practice and the third, the teachers' attitude toward ICTs.

Mastery and Use of ICTs

In this first section, we identified the degree of training the teacher has in ICTs. We included questions aiming at recognizing the extent to which the teacher handled the first or second generation technologies (those linked to Web 2.0.), as well as their didactic domain. The responses emphasize the fact that the teachers belong to the first generation, i.e., they use technologies more as consumers of information than producers of materials; they say using e-mail, instant messaging, Internet, software (Office package) and computer. On the other hand, they acknowledge not mastering the tools that could help their teaching be more interactive if they knew how to create content, such as wikis, blogs, web pages or Google Docs, which are linked to active teaching.

Table 1. Assessment of the Technical Mastery of the Tools

Valore su formación para el dominio técnico de las herramientas

Opciones	Muy buena	Buena	Regular	Pobre	Ninguna
Computadora	29.41	50	20.58	0	0
Internet	26.47	61.76	11.76	0	0
Software (Office)	11.76	58.82	23.52	5.88	0
Software específico	8.82	23.52	41.17	14.7	11.76
Entornos virtuales	14.7	32.35	23.52	20.58	8.82

Videoconferencia	11.76	41.7	11.76	20.58	14.7
Correo	47.05	47.05	5.88	0	0
Mensajería instantánea	41.17	35.29	14.7	5.88	2.94
Edición y reproducción de videos	2.94	14.7	41.17	50	50
Portafolio	5.88	11.76	26.47	32.35	23.52
Desarrollo de páginas web	5.88	0	26.47	5.88	61.76
Wikis	5.88	20.58%	17.64	14.7	41.17
Blogs	5.88	23.52	17.64	26.47	26.47
Google Docs	8.82	23.52	29.41	11.76	26.47

In regard to the didactic use of the tools, there is a similarity between the perception of the technical domain and the didactic domain. Thus, the teachers consider that they have a good mastery of didactics in the first generation tools: e-mail, Internet, basic software (Office package), instant messaging, but they lack didactic training in the second generation.

Table 2. Assessment of the Didactic Tool Training

Opciones	Muy buena	Buena	Regular	Pobre	Ninguna
Computadora	26.47	38.23	26.47	8.82	0
Internet	29.41	44.11	14.7	8.82	2.94
Software	11.76	52.94	23.52	8.82	2.94

Software específico	5.88	20.58	41.17	14.7	17.64
Entornos virtuales	14.7	32.35	20.58	11.76	20.58
Videoconferencia	14.7	29.41	17.64	8.82	29.41
Correo	41.17	47.05	5.88	5.88	0
Mensajería instantánea	26.47	44.11	8.82	2.94	17.64
Edición y reproducción de videos	5.88	8.82	44.11	14.7	26.47
Portafolio	5.88	14.7	23.52	20.58	35.29
Desarrollo de páginas web	5.88	5.88	17.64	8.82	61.76
Wikis	5.88	20.58	11.76	8.82	52.94
Blogs	8.82	17.64	11.76	20.58	41.17
Google Docs	8.82	17.64	32.35	5.88	35.29

In regard to the training in ICTs, the majority of teachers declared being self-taught: learning through trial and error by using simple and intuitive tools, such as Internet browsing, e-mail and instant messaging; regarding more complex tools, they have taken courses, such as virtual settings, software (Office) and computer courses.

Table 3. Technological Tools Learning Method

Opciones	Por medio de cursos	Autogestión. Prueba y error	Pregunta a compañeros	No lo utilizo	Total
Herramientas	32.35	55.88	11.76	0	34

Computadora	44.11	55.88	0	0	34
Internet	23.53	70.59	5.88	0	34
Software general	47.06	47.06	5.88	0	34
Software específico	32.35	38.24	17.65	11.76	34
Entornos virtuales	44.12	20.59	20.59	14.71	34
Videoconferencia	20.59	41.18	17.65	20.59	34
Correo electrónico	11.76	70.59	17.65	0	34
Mensajería instantánea	5.88	70.59	20.59	2.94	34
Edición y reproducción	11.76	41.18	23.53	23.53	34
Portafolio electrónico	8.82	17.65	20.59	52.94	34
Desarrollo de páginas	17.65	2.94	5.88	73.53	34
Wikis	32.35	11.76	2.94	52.94	34
Blogs	26.47	11.76	11.76	50	34
Otras	14.71	20.59	23.53	41.18	34

Table 3 highlights the fact that teachers do not use second generation tools, they have not taken any course on them; they have not explored them on their own or shared their doubts with their peers. The above either shows a lack of interest in ICTs or that ICTs are seen as something complex, as may be the case of web pages and wikis.

Options

In this second section we identified which tools the teachers said they used most in the classroom. Consistent with the first section, the most frequently used tools are the electronic mail and PowerPoint. This indicates that teachers are using the tools to reproduce information and make little use of those associated with a more constructivist type of learning, such as Web 2.0. However, we can see that they are starting to resort to discussion forums, group work forums, as support tools for teaching.

Table 4. Tools Used as Course Support

Competencias digitales

Herramientas de apoyo al trabajo docente		
Opciones de respuesta	Porcentaje	Respuestas contadas
Correo electrónico	100.0%	28
Foros de discusión	50.0%	14
Foros de trabajo grupal	50.0%	14
Buzón de tareas	46.4%	13
Lecciones	32.1%	9
Exámenes virtuales	10.7%	3
Wikis	10.7%	3
Mapas mentales o conceptuales en formato <i>online</i>	25.0%	7

Presentaciones de PowerPoint, Prezi u otra modalidad

89.3%

25

As for forums, we found that some teachers were using the Moodle and the Classrom platforms as support for teaching. This is consistent, since the unit has offered several basic and intermediate courses on the use of the Moodle platform, and several coordinators of studies have decided to use this tool to support their classroom work.

Section on Attitudes and Obstacles Toward ICTs

In regard to the obstacles in integrating ICTs into the educational practice, teachers responded that the main problem is the lack of technical support, which shows that teachers still do not feel confident regarding the mastery of technological tools. Secondly, they said needing more training, which reinforces the idea of their lack of self-confidence before ICTs; and thirdly, the teachers' resistance to implement the technologies recognized by the unit's own professors.

Table 5. Obstacles in Integrating ICTs in the Unit

Obstacles to Integrating ICTs	
Element	Percentage
Lack of technical support	21
Lack of pedagogical support	12
Lack of time to develop courses	8
Need of teacher training in virtual settings	20
Lack of institutional support	8
Render times and spaces of the educational act more flexible	14
Resistance of the teaching staff to implement technologies	17

Teachers perceive ICTs negatively. These attitudes can be grouped into two groups: those relating to the technical aspects of ICTs and those relating to the pedagogical aspects. In the first, teachers complain mainly about the failure of the tools and the technical service. In the second, they

consider difficult deepening into the contents when using technology; they prefer personal contact to that mediated by technologies; that the Internet encourages individual use, isolated from the other classroom mates besides generating copy-paste practices and lastly, that it is more difficult to moderate a virtual than a face-to-face forum. Therefore, all these beliefs influence the little motivation they may have to incorporate ICTs in their educational practice.

Ultimately, the professors of the unit who are dedicated to teacher training have a conservative vision of ICTs. This means that they either do not consider them as valuable tools for pedagogical work in the classroom, or that the transformation of the practice educational does not require technologies. Teachers have not recognized that we are facing a change of era in which young people naturally use technologies in their daily lives and that this technological impulse can trigger more active cutting-edge teaching-learning processes.

Table 6. Perceptions on Technologies and Learning

Perceptions on Technologies and Learning					
	Totally agree (%)	Agree (%)	Partially agree (%)	Disagree (%)	Totally disagree (%)
Most professors prefer face-to-face contact in their classes rather than the contact mediated by technology	10	10	40	20	20
Most teachers are little motivated in incorporating technologies in their teaching processes	6.67	13.33	50.00	23.33	6.67
The use of technology fosters isolated and individual work	13.33	26.67	40	10	10
The use of the Internet generates copy-paste practices	6.67	40	40	3.33	10
The use of the Internet and virtual learning settings promote a change of role in teachers and students	10	30	20	30	10
It is more difficult to plan learning activities on the Net than in the onsite format	16.67	30	43.33	3.33	6.67

Moderating a virtual forum is more demanding than moderating an onsite classroom discussion	6.67	40	40	6.67	6.67
Technological support usually fails when more is needed	16.67	16.67	60	3.33	3.33
It is more difficult to deepen into the contents of a course when using technological means	6.67	30	46.67	10	6.67
The asynchronous character of virtual forums promotes the reflexive participation of advisors and students	10	23.33	30	23.33	13.33
The fact that communications in EVA are through text messages, the students develop writing skills	13.33	16.67	30	23.33	16.67

These negative perceptions about technologies explain the low response to the inclusion of ICTs in the Unit and the lack of confidence in the benefits they can bring to the teaching-learning processes.

DISCUSSION

Despite the policies and regulations that seek to promote the integration of ICTs into the classroom in our country, little progress has been made in this regard. As Barberà (2004) mentions, that notwithstanding the fact that we have started the 21st century with high expectations about the use of ICTs, the transformation of educational practices in the classroom up to now has not undergone any major changes. Lastly, policies and programs for the integration of ICTs have not been able to materialize successfully in our educational system.

Such is the case of teacher trainers. The findings target the use of the tools at a basic level. UNESCO recognizes three levels of ICTs integration and states that "the acquisition of skills for the management of technology contemplates a course of development where increasingly sophisticated skills are gradually acquired" (cited in Díaz-Barriga *et al.*, 2009, p.76). The first level is the basic, and the second, the deepening of knowledge which is characterized by the use of didactic methodologies in using ICTs and more sophisticated ICTs, such as the Web 2.0 tools. At this stage, the teacher assumes the role of guide and administrator of the

learning environment. The third stage is the creation of knowledge, in which it is expected that the teacher can begin to innovate, produce knowledge and be creative in the use of ICTs.

This research also highlights the teachers' negative perceptions of ICTs. Contrary to the opinion of Rueda (2007) and Gibson and Olbeg (cited in Coll, Mauri & Onrubia, 2008), who identified not only positive attitudes towards ICTs in most of the European and Argentinean teachers, but also a poor use of ICTs which shows a low level of integration. On the other hand, our results show negative perceptions towards the use and the advantages the tools can provide to education, which translates into a low motivation for their integration into the classroom. The correlation between negative attitudes and low integration of ICTs occurs despite the fact that the teaching staff is not that old, since 19% are between the ages of 41 to 45, and 16%, between the ages of 36 to 41. It is not surprising, because these professors are still digital migrants, according to Prensky (2003)'s typology.

A different interpretation of these results may refer to the work of Orellana *et al.* (2004), who, in a study conducted in three regions of Spain, found that the teachers' attitudes toward ICTs were linked to the teachers' level of technical mastery; hence, a low level of mastery of the tools caused a greater apprehension in using ICTs and misbelief in their advantages. Likewise, the authors aforementioned linked the teachers' positive attitudes toward ICTs to the incorporation of computers in the classroom. When the classrooms are equipped with infrastructure and technologies, greater is their use and a more positive is the attitude toward them.

All these elements interweave; although, more research would be needed to find specific correlations among these categories. Hence, a low mastery of the use of the tools in the Unit would be a factor of influence, as well as the negative attitudes toward them, which translate into their little integration in the classroom.

Another reason for the lack of integration of ICTs in the classrooms that has sprung from this research and also from other similar studies (Eudave & Carvajal, 2011; García, 2002) has been the lack of technical support in educational centers. The teachers' little familiarization with the tools in the first stages of integration requires a greater technical support to help teachers reduce their stress and their lack of self-confidence. The technical support constitutes not only a first barrier but also a framework that allows the teacher to lose his fear of integration of ICTs. Therefore, for example, the report on the incorporation of the Program for the Strengthening of the Teaching-Learning Process of the Scientific Areas of High Schools in Jalisco, points out that the schools that had a person responsible in giving support to the teacher had a greater inclusion of ICTs and the students reaped more benefits than those of schools that did not have such support.

According to the teachers, the lack of training represents another barrier which is consistent with the opinion of Ansaldi (2008), García (2002) and Gómez (2003). Along these lines, it is worth mentioning that the training received by the teacher trainers is not regulated as that of teachers of basic education. Teacher trainers receive their training within the University through the Technology Coordination Center and through courses taught within the institution itself. Hence, teachers report being self-taught in simple actions, such as the use of the Internet, e-mail and web browsing, in addition to having taken courses in Office, learning management systems or platforms and, more recently, virtual learning environments. This reveals the importance of receiving training in the workplace. According to the literature reviewed, low training has an influence on the use of tools and their minimal integration within educational practices. According to UNESCO, a first step is to know and become familiarized with the tools and, secondly, to mobilize didactic strategies to use within the classroom.

Within this framework, the electronic mail and PowerPoint have been reported as the tools mostly used in the classroom which indicates the use of tools that provide access to information and which are associated with transmissive models of knowledge. "The use of the computer as a simple word processor, information seeker or substitute for the visual representation of the blackboard to carry out reviews, will continue to perpetuate traditional training schemes" (García, 2002, p.7). These results are not surprising, since professors have grouped around specializations and programs that provide them with the knowledge and expertise in their subject area; hence, it seems unnecessary to them to have any training in technologies, because, as some have mentioned, the professors in the area of humanities require and demand face-to-face contact as the most suitable mean of teaching. However, there are also teachers who use ICTs to discuss ideas and carry out collaborative work, although they are not the majority. These teachers have ventured in virtual classrooms, as the data obtained reveal, which refer to the use of group work and discussion forums, as well as task mailboxes.

CONCLUSIONS

Even though we might think that the UPN professors, given their pedagogical specialization, would make a greater use of ICTs and incorporate them in an innovative manner in their classroom, it is not so. The strong resistance felt by the teaching staff toward ICTs prevents them from reaping the benefits ICTs offer education.

We have also identified a strong correlation between the attitudes toward ICTs and teaching practices. It seems that negative attitudes and the little interest in the incorporation of or learning about ICTs are caught in a vicious circle. The use reported of ICTs is basic and of the first generation. This leads to the repetition of transmissive practices of knowledge. We also noticed the little enrolment of teachers in training

and updating courses in using the most attractive tools from a teaching standpoint, such as Web 2.0.

Teachers colleges are facing a great challenge: the new training is being carried out online and other universities such as UPN Ajusco [National Pedagogical University], the Tecnológico de Monterrey [Monterrey Technological Institute], and even the Escuela Normal de Jalisco [Jalisco Teachers College], are updating to be able to face this challenge while the Unit has been lagging, leaving behind the opportunities this new century is offering.

On the other hand, the current educational reform scenario in Mexico has limited courses on ICTs and giving more importance to the contents of the reform. Therefore, UPN units are opening the way to different educational options that seek to connect the requirements of the Ministry of Public Education with the reform. Moreover, we must take into consideration the low level of infrastructure of our schools, among them, the Unit itself, which is why we consider that these conditions are not conducive to the integration of ICTs. This is a very important setting since it creates a scenario where teachers and the authorities themselves must fight against the immediate demands and the unfavorable circumstances in which schools are reduced.

The limitation of this research is that we have not used a qualitative approach of the teaching practices or of the opinion of the university professors, which would have enabled us to delve deeper in what are, from their standpoint, the beliefs that hinder the use of ICTs; and also to know what kind of tools, beyond PowerPoint, are being used in the Unit; for example, what would be the profiles of those managing the Moodle platform and how do they use it; and what other teacher training schools are doing to include ICTs.

More research would be needed to approach other teacher training schools, more specifically the UPN units, in order to know what every unit is doing in particular and the results they have obtained, and how they undertake actions to move toward an effective use of ICTs.

Aldridge, Alan & Levine, Ken. (2003). *Topografía del mundo social. Teoría y práctica de la investigación mediante encuestas*. España: Gedisa.

Ansaldo García, Sergio Antonio. (2008). La cultura de la capacitación magisterial: el caso del software logo en la secundaria técnica 40 de Guadalajara, Jalisco. *Estudios Sociales*, núm. 4, pp. 189-210. Recuperado de <http://www.publicaciones.cucsh.udg.mx/ppperiod/estsoc/volumenes/estsc4.htm>

Barberà, Elena. (2004). *La educación en la red. Actividades virtuales de enseñanza y aprendizaje*. España: Paidós.

Castañeda Castañeda, Arturo, Carrillo Álvarez, Jesús & Quintero Monreal, Zaira. (2013). *El uso de las TIC en educación primaria: la experiencia Enciclomedia*. México: Red de Investigadores Educativos, AC. Recuperado de <http://redie.mx/librosyrevistas/libros/usoticseducprim.pdf>

Coll, César, Mauri, Teresa & Onrubia Javier. (2008). La utilización de las TIC en la educación: del diseño tecno-pedagógico a las prácticas de uso En César Coll & Carles Monereo (eds.). *Psicología de la educación virtual* (pp. 74-104). Madrid, España: Morata.

Coll, César & Monereo, Carlos. (2008). Educación y aprendizaje en el s. XXI: nuevas herramientas, nuevos escenarios, nuevas finalidades. En César Coll & Carles Monereo (eds.). *Psicología de la educación virtual* (pp. 19-53). Madrid, España: Morata.

Díaz-Barriga, Frida, Padilla Magaña, Rosa Aurora & Morán Ramírez, Héctor. (2009). Enseñar con apoyo de las TIC. Competencias tecnológicas y formación docente. En Frida Díaz-Barriga, Gerardo Hernández & Marco Antonio Rigo (eds.). *Aprender y enseñar con TIC en educación superior: contribuciones al socioconstructivismo* (pp. 63-95). Ciudad de México, México: UNAM.

Eudave Muñoz, Daniel & Carvajal Ciprés, Margarita. (2011). *Posibilidades y usos de las TIC en educación básica*. Trabajo presentado en el XI Congreso Nacional de Investigación Educativa, Ciudad de México, México. Recuperado de www.comie.org.mx/congreso/memoriaelectronica/v11/docs/area_07/2443.pdf

García Acosta, Gabriela. (2002). *Uso y disponibilidad de la tecnología educativa en escuelas de educación básica*. Recuperado de

<http://bibliotecadigital.conevyt.org.mx/colecciones/documentos/somece2002/Grupo1/garcia.pdf>

Gobierno de la República Mexicana. (2013). *Estrategia Digital Nacional*. Recuperado de <http://cdn.mexicodigital.gob.mx/EstrategiaDigital.pdf>

Gómez López, Javier & Cano Escoriaza, Jacobo. (2011). El pensamiento docente y su influencia en la implantación de las tecnologías de la información y la comunicación en el aula: desafíos y oportunidades. *Contextos Educativos, Revista de Educación*, núm. 14, pp. 67-84. <http://dx.doi.org/10.18172/con.640>

Gómez Malagón, María Guadalupe. (2003). *Retos de las tecnologías de la información y comunicación como innovación en las escuelas públicas de educación básica en México*. Recuperado de www.lie.upn.mx/docs/DiplomadoPEC/TicMGGM.pdf

Hernández Sampieri, Roberto, Fernández Collado, Carlos & Baptista Lucio, Pilar. (2015). *Metodología de la investigación* (5ª ed.). Ciudad de México, México: McGraw-Hill.

Loredo Enríque, Javier, García Cabrero, Benilde & Alvarado García, Francisco. (2010). Identificación de necesidades de formación docente en el uso pedagógico en Enciclomedia. *Sinéctica, revista electrónica de educación*, núm. 34, pp. 1-16. Recuperado de <https://sinectica.iteso.mx/index.php/SINECTICA/article/view/138/>

Morales Arce, Víctor Gerardo. (2013). Desarrollo de competencias digitales docentes en la educación básica. *Apertura*, vol. 5, núm. 1. Recuperado de <http://www.udgvirtual.udg.mx/apertura/index.php/apertura/article/view/367/307#resu>

Orellana, N.; Almerich, G.; Belloch, C. & Díaz, I. (2004). La actitud del profesorado ante las TIC: un aspecto clave para la integración. En *Actas del Quinto Congreso del Encuentro Internacional sobre Educación, Capacitación Profesional y Tecnologías de la Información. Virtual Educa, Barcelona* (pp.1- 13). Recuperado de <http://repositorial.cuaed.unam.mx:8080/jspui/bitstream/123456789/2210/1/1.5.27.doc>

Ramírez Orellana, Elena, Cañedo Hernández, Isabel & Clemente Linuesa, María. (2012). Las actitudes y creencias de los profesores de secundaria sobre el uso de Internet en sus clases. *Revista Comunicar*, vol. 19, pp. 147-145. Recuperado de <http://www.revistacomunicar.com/index.php?contenido=detalles&numero=38&articulo=38-2012-18>

- Rueda Ortiz, Rocío. (2007). *Para una pedagogía del hipertexto. Una teoría de la deconstrucción y la complejidad*. España: Anthropos.
- Santiago Benítez, Gisela; Caballero Álvarez, Rebeca; Gómez Mayén, Diana & Domínguez Cuevas, Atenea. (2013). El uso didáctico de las TIC en las escuelas de educación básica en México. *Revista Latinamericana de Estudios Educativos*, vol. 43, núm. 3, pp. 99-131.
- Secretaría de Educación Pública. (2016). Formación continua de docentes de educación básica [portal web]. México. Recuperado de <http://formacioncontinua.sep.gob.mx/portal/home.html>
- Secretaría de Educación Pública (SEP). (2012). *Programa Habilidades Digitales para Todos. El libro blanco (2009-2012)*. Recuperado de <http://sep.gob.mx/work/models/sep1/Resource/2959/5/images/LB%20HDT.pdf>
- Sistema de Información Básica de Educación Normal (SIBEN). (2016). Estadísticas. Recuperado de <http://www.siben.sep.gob.mx/pages/estadisticas#>
- Unesco. (2005). Regional Guidelines on Teacher Development for Pedagogy and Technology Integration. Recuperado de <http://unesdoc.unesco.org/images/0014/001405/140577e.pdf>
- Vaillant, Denise. (2013). *Integración de TIC en los sistemas de formación docente inicial y continua para la educación básica en América Latina*. Recuperado de http://www.unicef.org/argentina/spanish/educacion_Integracion_TIC_sistemas_formacion_docente.pdf

