

Empoderar a los profesores en su quehacer académico a través de certificaciones internacionales en competencias digitales

Empower teachers in their academic work through International Certifications in Digital Competencies

<http://dx.doi.org/10.32870/Ap.v10n1.1174>

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RESUMEN

Palabras clave

Empoderamiento,
competencias digitales,
formación docente, TIC

Este trabajo tiene el objetivo de evidenciar la importancia del desarrollo de las competencias digitales en los profesores universitarios para empoderar su quehacer académico con el apoyo de las tecnologías de la información y la comunicación. En este sentido, la Universidad Autónoma de Tamaulipas ha capacitado a 124 profesores de las diferentes facultades en el Programa de Certificación Internacional en Competencias Digitales (ICDL), de los cuales hasta el momento 76 han acreditado la certificación base—ICDL relacionada con conocimientos fundamentales de computación, conocimientos fundamentales de cursos en línea, procesador de textos y hojas de cálculo. Para ello, los profesores tuvieron que realizar pruebas de nivel, estudiar lecciones y desarrollar de manera autodidacta distintos tipos de ejercicios y prácticas hasta presentar su examen de certificación. Este trabajo da cuenta de sus avances en la adquisición de las competencias digitales y compara los resultados que alcanzaron al inicio y final de la certificación. Para que las universidades brinden respuesta a los desafíos de la educación superior del siglo XXI, estas deben invertir en la capacitación de sus profesores, quienes deben tener un perfil docente especializado, conocer métodos pedagógicos, ser expertos en contenidos y obtener certificaciones en competencias digitales reconocidas por organismos internacionales que garanticen su calidad.

ABSTRACT

Keywords

Empowerment, e-skills,
teacher education, ICT

This work has the aim to demonstrate the importance of the development of the digital competencies in the university teachers to empower his academic work with the support of the Technologies of the Information and Communication (ICT). In this sense, the University of Tamaulipas (UAT) Mexico has trained a total of 124 teachers from the different UAT schools in the International Certification Program in Digital Competencies—ICDL, of which up to now 76 teachers have accredited the Basic Certification—ICDL related with Computer Fundamentals, Online Course Fundamentals, Word Processor and Spreadsheets. To do this, teachers had to perform level tests, study lessons and develop, in a self-taught manner, different types of exercises and practices, until submitting their certification exam. This paper also presents the advances that teachers had in the development of their digital competences, comparing the results of the beginning and the end of the certification. Universities should invest in the training of their teachers, in order to respond to the challenges of the 21st century higher education, mainly because they require a specialized teaching profile, sufficient background in pedagogical methods, expertise in contents and certifications in digital competencies recognized by international organizations that guarantee their quality.

Received: March 3, 2017

Accepted: September 29,

2017 Online Published:

March 30, 2018

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INTRODUCTION

Even though information and communication technologies (ICTs) continue their accelerated progress, their incorporation into the educational processes does not experience the same dynamism and intensity required for the new generations of students to assimilate the 4Cs of learning in the 21st century: communication and collaboration; creativity and innovation; critical thought and problem solution. According to Scott (2015), these competences and abilities must be taught in the context of the 21st century fundamental subjects and thematic settings. A selected group of countries leads the world and invest heavily in education and in this type of initiatives; the United States of America, the United Kingdom, Germany, Australia, Canada and France are among these countries (Matos, 2016).

The rapid development of ICTs has left many university professors struggling to stay abreast and not be excluded by generational changes. However, while much of the current debate focuses on the capacity universities have to offer students flexible and innovative educational models as well as state-of-the art ICTs that allow the students to obtain professional competences currently required by institutions, organizations and enterprises, little is mentioned on the ongoing training and specialization of university teaching staff. It seems that we have lost sight of the 21st century professors who, as for students, need to learn, unlearn and relearn to be ad hoc in the face of educational demands rising from globalization and learning virtualization.

Teachers will always be vital actors in all the educational processes regardless of the educational model (on-site, b-learning, e-learning or m-learning), and even more if they are considered as agents of change that support students in their self-construction with strategies that foster creativity, innovation, critical thought and problem solving. Every student has his own strengths and weaknesses, pace and styles that must be identified and analyzed to foster his self-discovery and formulate his own hypotheses and ideas, establish interconnections to reach his goals and broaden his perspectives.

The initial question is: how can professors' academic work be empowered to respond to the challenges posed by the 21st century education? Let us start by analyzing empowerment and looking for the way to promote professors' academic work. Empowerment comes from the English verb to empower, from which derives the noun empowerment. Empowerment is the process by which individuals, groups and communities become capable of controlling their circumstances and reach their objectives in striving to maximize their quality of live. (Powell, 1990).

For Rappaport (1987), empowerment “conveys both a psychological sense of personal control or influence and a concern with actual social influence,

political power, and legal rights. It is a multilevel construct applicable to individual citizens, as well as organizations and neighborhoods; it suggests the study of people in context” (p. 121).

By orienting empowerment toward education, Shor (1999) mentions:

Education for empowerment is defined as a critical democratic pedagogy for self and social change, student-centered in order to develop and strengthen his capacities together with academic knowledge, research habits, critical curiosity about society, power, inequality and its role in social change (p.15).

Torres (2009) points out that empowerment:

Is conceived as a conscientization process that makes the self realize its capacities which empowers its action to transform itself and transform its context; this allows to say that empowerment acquires other dimensions that transcend the self, hence raising the levels of trust, self-esteem and the capacity of the subject to respond to its own needs, to other collective forms in the process of social integration (p. 92).

Teacher empowerment emerges with great relevance since, before demanding university professors to offer a response to the challenges of the 21st century education, we must first build confidence in them in order to increase their strengths, improve their abilities and capacities as well as increase their academic potential as agents of change in any educational context. Hence, it is important to analyze in which way teachers who master digital competences can decisively implement, by means of a creative and innovative mentality, didactic strategies and teaching techniques through ICTs, diversify teaching and learning opinions and supplement the professional training of the new generations of students:

The importance of the role played by the teaching staff as agents of change, fostering Mutual understanding and tolerance, has never been as obvious as it is today. This Role will undoubtedly be even more decisive in the 21st century where obtuse rationalism shall have to give way to universalism, ethnic and cultural bias to tolerance, comprehension and pluralism and a world divided in which high technology is the privilege of only a few, to a world technologically united. This imperative entails enormous responsibilities for the professors who participate in the formation of the character and the mind of the new generation (Delors, 1996, p. 162).

Table 1 shows the educational benefits professors who have certifications in digital competences can provide.

Table 1. Educational Benefits of Certifications in Digital Competences

Educational Benefits	Academic Activities
<p>Improve professors' communication and collaborative work through online academic networks.</p>	<p>The best academic practices can be shared online, within or outside the university.</p> <p>Online professional networks allow teachers to supplement their professional and labor development.</p> <p>Online collaboration tools encourage collective writing and support teachers in the development of publications.</p> <p>Las herramientas de colaboración en línea propician la escritura colectiva y apoyan a los profesores en el desarrollo de publicaciones</p>
<p>Save time by making it easier for professors to perform administrative and school control processes.</p>	<p>Data electronic management facilitates for students the control and search of information.</p> <p>The management of electronic communication means improves communication and response time in delivering academic achievement grades and reports</p>
<p>Increase the professors' performance and academic productivity</p>	<p>The access and analysis of sources of bibliographic information available on the Web contribute to the incorporation of curricular plans and programs, updated educational contents and resources.</p> <p>Managing electronic formats to elaborate learning activities fosters feedback and assessment of programmed activities in teachers</p>
<p>Support and promote educational creativity and innovation</p>	<p>The incorporation of ICTs in the teachers' academic work is the prelude to innovative initiatives such as the "flipped classroom".</p> <p>The efficient management of ICTs facilitates the design of didactic strategies and teaching techniques that adapt to the different learning styles and pace of the students</p>

Supplement the traditional academic work by incorporating technological applications	<p>The use of asynchronous tools such as self-assessments, activity sending, discussion forums, wikis and blogs, supplement the teacher's work in traditional classrooms.</p> <p>Access to success stories in any subject area available on the Web helps students to supplement their knowledge and academic experience</p>
Promote in teachers a positive attitude toward lifelong learning	<p>The mastery of ICTs offers professors the competences, abilities and attitudes necessary to be successful in any work setting, including in their personal lives.</p> <p>By knowing the international tendencies related to education, professors develop an intercultural learning and maximize their academic work</p>

Source: developed by the author.

University professors require an extensive and ongoing exposure to ICTs regardless of whether they were born in the generation of baby boomers (1945-1965), generation “X” (1966-1980) “Y” or millennials (1981-1995) and even those born in generation “Z” or “digital natives” (1996-present). It is a fallacy to think that millennial teachers or digital natives do not need to train in ICTs for the simple fact they were born in these last generations.

Universities must promote digital literacy in professors through certifications of digital competences in order for them to acquire the know-how to implement with security, enthusiasm and motivation, creative and innovative strategies in their educational contexts, besides setting the prelude so the students may also know the benefits and potentialities of ICTs with a pedagogical sense, arising mainly from the learning curve that university professors must experience first.

DIGITAL COMPETENCES CERTIFICATIONS

According to the National Council for the Standardization and the Certification of Labor Competences (Conocer, 2016):

People's competences are individual knowledge, skills, abilities and behaviors, i.e., what makes them competent to develop an activity in their labor life. On the other hand, the certification of competences is the process through which people show, through evidence, they have the knowledge, skills and abilities, regardless of how

they acquired them, necessary to comply with a function at a high level of performance according to the definition of a competence standard (§ 2).

Currently, certifications of competences are increasingly valued by employers, and even more so if they have international recognition. More specifically, they are different providers on the market offering ICDL international certifications in digital competences to institutions, organizations and enterprises. In this study, we will talk about ICDL international certifications, since the Universidad Autónoma de Tamaulipas (UAT [Spanish acronym for the Tamaulipas Autonomous University]), in collaboration with the National Distance Education System became in 2012 an ICDL Accredited Test Center, and in 2014, the ICDL Digital Competence International Certification Program was implemented for its university professors. It should be mentioned that 124 professors of the 24 UAT faculties have participated in this institutional program, of which 76 have already been granted the ICDL base certification: fundamental computer knowledge, fundamental knowledge of online applications, word processor and spreadsheets.

This certification is known in Europe as the European Computer Driving License (ECDL) and in Latin America, as the International Computer Driving License (ICDL). The latter is offered in more than 100 countries, in 41 different languages through its network of more than 20 000 accredited test centers. Currently, more than 14 million people have participated in some of their certifications (ICDL, 2016b). Figure 1 shows the three types of certification offered by the ICDL Accredited Test Center in UAT.

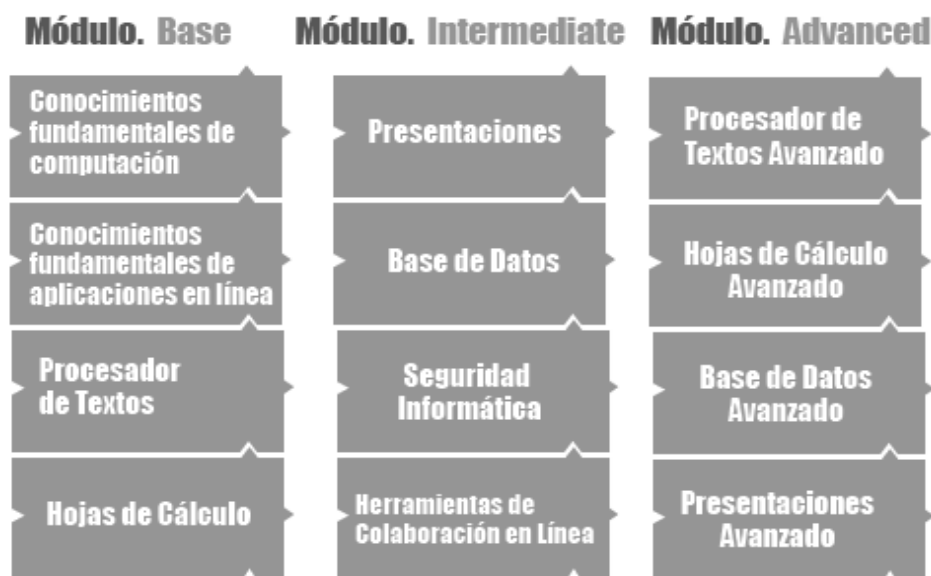


Figure 1. ICDL International Certifications.

Next, we will describe each module corresponding to the ICDL base certification, object of this study:

- **Fundamentals of computer knowledge.** “This module teaches the fundamental concepts and skills related to the use of devices, creation and administration of files, networks and information security” (ICDL, 2016c, §3).
- **Fundamentals of online application knowledge.** “This module teaches the fundamental concepts and skills for Web browsing, effective search for information, online communication and e-mail (ICDL, 2016c, §4).
- **Word processor.** “This module teaches how to use word processing application to carry out daily tasks related to the creation, format and small documents completion such as letters and other everyday word documents” (ICDL, 2016c, §5).
- **Spreadsheets.** “This module teaches concepts as well as the performance of tasks related to the development, format, modification and use of spreadsheets, formulae and standard functions management and the creation and format of graphs and tables” (ICDL, 2016c, §6).

INSTRUCTION METHODS

The instructional method used for ICDL certification is supported on the Kplace technology platform, which is a learning tool that allows teachers to develop and deepen their knowledge about the use of application programs (Kplace, 2016). Figure 2 shows the stages of the instructional method graphically.

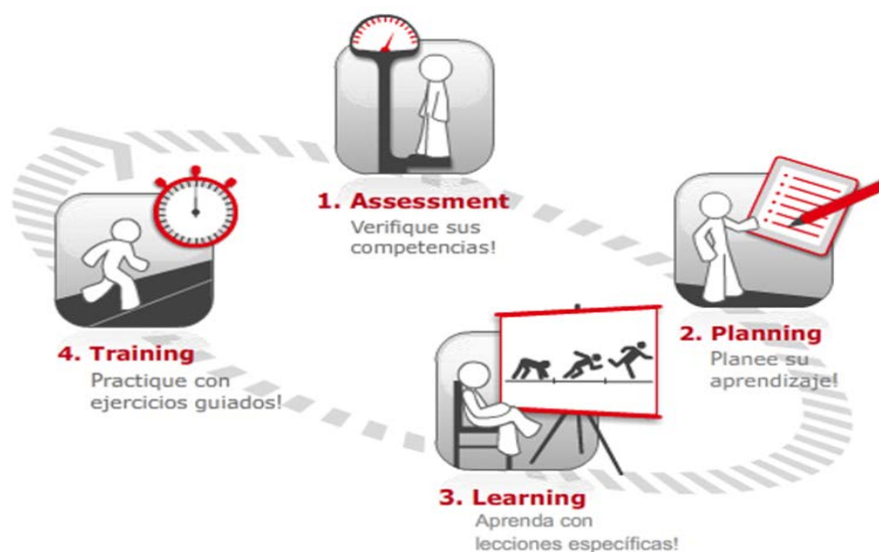


Figure 2. Instructional method for the ICDL international certifications.

Next we break down each of the stages of the instruction method:

- **Assessment.** At this stage, the level tests are applied to verify the degree of the teachers' knowledge and skills and to identify their technological strengths and weaknesses. The level tests must be completed within a certain time and have a limited number of attempts to confirm the responses.

- **Planning.** This stage allows examining the results of the level tests and suggests a learning course focused on the participant's specific needs. The graph shows the summary of the level of competences and indicates the lessons and exercises that teachers must carry out in order to continue with their personalized learning.
- **Learning.** This stage contains audiovisual lessons that will help teachers deepen their knowledge and skills. All the lessons are supplemented by images, animations, descriptions and a pre-recorded voice that will guide the teachers through the different topics.
- **Training.** After having self-studied the audiovisual lessons, the teachers, at this stage, can continue practicing with a series of exercises very similar to those they did at the level test to reinforce their knowledge and technological skills before the certification exam (Kplace, 2016).

In the ICDL Digital Competences Certification Program of the UAT, the ICDL base certification has 120-hour duration and consists of four modules: Fundamentals of computer knowledge, Fundamentals of online application knowledge, word processor and spreadsheets. It is important to mention that, in order to achieve the accreditation of each of these modules, the teachers had to carry out the instruction method as many times as necessary until the level test was accredited. The objective was to seek building their self-confidence to take the corresponding certification exam.

RESULTS

It is important to mention that the sampling consisted of 124 professors of the different faculties of the UAT who are participating in the ICDL Digital Competences International Certification; however, the sample for this study is made up of 76 professors who, so far, have been accredited the ICDL base certification.

We analyzed the results through the following procedure:

- We added the grades and obtained the averages of the 76 professors in the level tests; we identified the arithmetic mean for each of the digital competences corresponding to the modules of the fundamentals of computer knowledge, fundamentals of online applications knowledge, word processor and spreadsheets that integrate the ICDL base certification.
- We added the grades and obtained the averages of the 76 professors in the certification exams; we identify the arithmetic mean in each of the digital competences corresponding to the four modules that make up the ICDL base certification.

- We obtained the general averages of the level tests and the certification exams of the 76 professors in each of the modules of the ICDL base certification: fundamentals of computer knowledge, fundamentals of online applications knowledge, word processing and spreadsheets.
- We conducted a descriptive analysis based on the statistical results obtained from the comparison of the general averages between the level tests and the certification exams obtained by the 76 teachers who participated in the ICDL base certification.

Table 2 contains the breakdown of the arithmetic means of each of the competences corresponding to the fundamentals of computer knowledge module, as well as the general averages of the level tests and the certification exams of the 76 professors.

Table 2. Averages of the fundamentals of computer knowledge module

Competences	Level Tests	Certification Exams
Computers and devices	90	90
How to use Windows	92	89.43
Exits	75	93
File Management	55	91
Networks	51	95
Security and wellbeing	58	91
General average	70.16	91.57

Source: developed by the author.

Table 3 shows the breakdown of the arithmetic averages of each of the competences of the fundamentals of online applications knowledge module, as well as the general averages of the level tests and the certification exams of the 76 professors.

Table 3. Averages of the fundamentals of online application knowledge module

Competencias	Pruebas de nivel	Exámenes de certificación
Conceptos básicos de búsqueda en internet	75	89.78
Navegar en internet	86	90.55
Usar la Web	90	89.37
Conceptos de la comunicación	62	89.68
Cómo usar el e-mail	45	90.89
Promedio general	71.60	90.05

Source: developed by the author.

Table 4 shows the breakdown of the arithmetic means of each of the competences of the word processor module, as well as the general averages of the level tests and the certification exams of the 76 professors.

Table 4. Averages of the Word processor module

Competencias	Pruebas de nivel	Exámenes de certificación
Módulo procesador de textos	83	85
Uso de la aplicación	85	87
Creación de documentos	69.90	88.43
Formateo	77	84
Objetivos	70	90.43
Combinación de correos electrónicos	50	88.87
Prepare las salidas	52	89.54
Promedio general	69.56	87.61

Source: developed by the author.

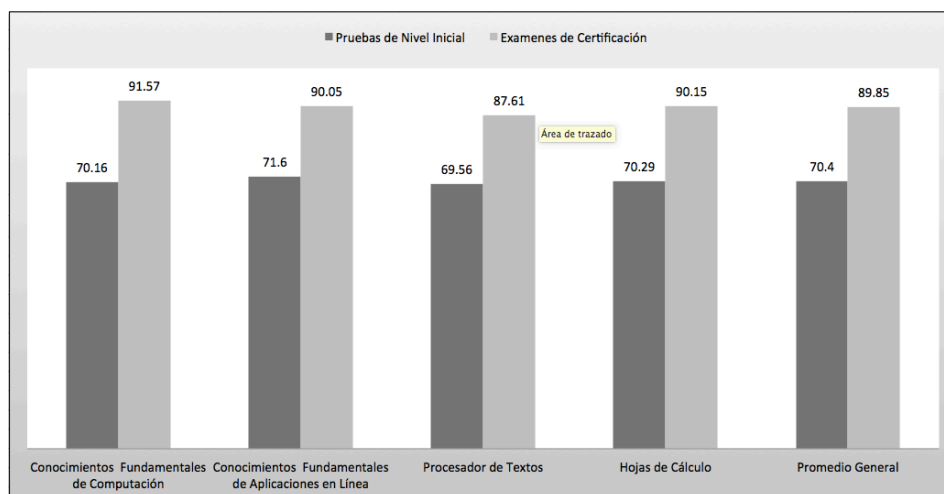
Table 5 contains the breakdown of the arithmetic means of each of the competences of the spreadsheet module, as well as the general averages of the level tests and the certification exams of the 76 professors.

Table 5. Averages of the spreadsheet module

Competencias	Pruebas de nivel	Exámenes de certificación
Uso de la aplicación	91	90.38
Celdas	70	90.63
Administración de hojas de trabajo	70	89.95
Fórmulas y funciones	60	90.62
Formateo	70	89.08
Cuadros	60	90.25
Prepare las salidas	71	90.11
Promedio general	70.29	90.15

Source: developed by the author.

The graph shows the comparison of the general averages obtained in the level tests and in the certification exams; this clearly shows the progress and development of the digital competences of the teachers who participated in the ICDL base certification.



Graph. General averages of the ICDL base certification.

It is worth mentioning that, based on the regulations of ECDL and ICDL Latin America, teachers had to obtain a grade equal to or higher than 75 in their certification exams in order to accredit each one of the four modules that make up the ICDL base certification.

The 76 professors who accredited the ICDL base certification will have the knowledge and digital competences to:

- Work and communicate with their students anywhere the world.
- Manage their time better and be more productive in their academic work.
- Be able to promote strategies for individual and collaborative work with the support of ICTs.
- Diversify their teaching and learning options and use the resources available on cloud to be accessed from any computer or mobile device.
- Study and manage their own learning through the Net, develop a positive attitude toward learning throughout their lives and consider the Internet as the main source of knowledge.

- Have an international certification that supplements their professional training besides being recognized institutionally, said certification offers them significant benefits in the Teaching Staff Performance Stimulus Program.

We should not lose sight that, currently, university professors, besides participating in updating and teaching specialization programs, are also required to carry out teaching, researching, tutoring activities and participate in collegiate bodies. Therefore, it is essential that higher educational institutions provide articulated benefits that stimulate their professors' interest and motivation in pursuing their ongoing training and updating while having the certainty that their efforts and work will not only provide them with the tools to be more productive in their academic work but also foster their professional development and their teaching career.

CONCLUSIONS

Universities, in order to respond to the challenges posed by the 21st century higher education, must not only invest in technological infrastructure or hire outsourcing services to implement innovative educational model; i.e., for students to reach their maximum potential through multimodal educational settings that promote the 4Cs of the 21st century learning, universities must invest in training their teachers mainly because the latter are required to have a specialized teaching profile, to know pedagogical methods, be an expert in contents and have the digital competences certifications recognized by international agencies that guarantee their quality.

Technologies for education have undergone dramatic changes, more specifically in regard to their functionalities to provide responses to the needs and issues arising from globalization and the virtualization of learning. This constant change also compels the redefinition of technologies based on tier functionalities, i.e., we currently have ICTs, learning and knowledge technologies (TAC), as well as technologies for empowerment and participation (TEP). In this sense, we must not be concerned about the terminology but we must rather focus in developing digital competences (skills and attitudes) in teachers so they are capable of combining their knowledge and teaching experience as well as their technological skills with digital educational strategies that maximize their teaching and maintain them updated with the 21st century educational tendencies.

Empowerment highlights the individual character from the collective, in reflecting and transforming the individual's reality in such a way that teacher empowerment allows the teacher to reflect and be more critical of his own educational practice and thus benefiting teaching (Cantoral & Reyes, 2013). The teacher will show greater satisfaction in his work since

he has the motivation necessary to enjoy what he is doing besides encouraging individual and collaborative work with his students, as well as with his own peers (Zemelman & Ross, 2009).

Teacher empowerment obtained through the digital competences international certification offers teachers greater attitudes and skills to combine their knowledge, didactic strategies and teaching techniques through synchronous and asynchronous means besides setting the prelude to promote in a creative and innovative manner, the 21st century learning in their class sessions in which critical thinking and problem solving as well as communication and collaboration are presented as essential to the development of new work competences currently required by enterprises.

Empowering university professors by mastering and adopting ICTs, TACs or TEPs will feed their personal and professional confidence, increase their teaching strengths, improve their teaching abilities and capacities, and increase their academic potential by making them in agents of change in any educational context.

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