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Teachers' Digital Skills training by using the Educational Innovation based on Evidence methodology (EIBE)

Celia Paola Sarango-Lapo¹, Juanjo Mena², María-Soledad Ramírez-Montoya³

¹*Universidad Técnica Particular de Loja*

cpsarango@utpl.edu.ec

²*Universidad de Salamanca*

juanjo_mena@usal.es

³*Tecnologico de Monterrey*

solramirez@itesm.mx

ABSTRACT

Digital competences have become one of the key requirements of teachers in today's education. These allow teachers to enhance the integration of technologies into their practices. However, there is still a lack of training in teachers in digital skills to be able to connect their knowledge with practice. The teacher training in Educational innovation based on evidence methodology (EIBE) allows this connection, since it has been shown to develop digital information competence. This competence helps sustain the formulation of innovative educational proposals that link practice with research. The present study investigates the level of perceived domain of digital information competence in teachers who participated in a virtual course on EIBE of a postgraduate program. The research methodology used was exploratory-descriptive. A questionnaire was applied to 39 teachers and an interview was applied to five teachers. One of the results from the questionnaire was that a low percentage of teachers placed their level of proficiency in the response options of excellent, regular and little dominion, while in a high percentage the teachers indicated to have a good domain, as well, no teacher is described with no domain. The teachers applied digital informational competences in the design and implementation of EIBE's innovative proposals, this was also found from the interview results. However, the need to continue training teachers is still obvious.

KEYWORDS: training teacher, information skill, digital skills, innovation based on evidence.

0. INTRODUCTION

The development of digital competences as one of the key competences of the 21st century plays an important role in teachers and students. This has allowed different organizations such as UNESCO (2008), ISTE (2008), ACRL (2000), European Commission (2013), INTEF (2017) propose norms or standards that orient educational institutions in training in technological skills and in the reflection on the integration of technologies in their practice. Undoubtedly the use of different technologies will favor the search, evaluation, storage and dissemination of information (Hepp, Prats and Holgado, 2015). However, the levels of integration of technologies vary according to the training, updating and innovation programs that the teacher incorporates into his teaching-learning processes (San Nicolas, Fariña and Area, 2012).

An adequate integration of technology into teaching practice demands training programs that lead the teacher to link their knowledge with practice. The EIBE methodology seeks to enable the teacher to apply digital information competences (search, evaluation, storage and communication) to support innovative practice proposals, thus linking teaching practice to research supported by digital skills (Ramírez, 2012). The training of teachers should be oriented to the reflection on the uses that can make of the technologies, which must be derived in innovative proposals that enhance the processes of teaching-learning (Hepp, Prats and Holgado, 2015).

The purpose of this paper is to investigate the level of perceived domain of digital information competence in teachers who participated in a virtual course on EIBE.

1. THEORETICAL FRAMEWORK

The development of digital competence in students is key to their integration and significant participation in the Knowledge Society. As pointed out by Pozuelo (2014), we are currently living in a process of permanent change, fundamentally in the ways of communicating, managing and use of information. In this way, informational digital competence acquires relevance, according to ACRL (2000) it is conceived as the set of skills to recognize the necessary information, locate it, evaluate it and use it effectively; As well as transforming it into knowledge (European Commission, 2013). Therefore, according to INTEF (2017), teachers, as responsible for teaching students, must be able to guide them in their learning process through the new means and forms presented by the Knowledge Society.

Several agencies and institutions developed standards aimed at teacher training in digital competition. Some of them like Unesco (2008), ISTE (2008), INTEF (2017), which orient educational institutions in the training of teachers to achieve an adequate management and integration of information and technologies in the teaching-learning processes. The three organizations emphasize the management and proper use of the information. In particular, INTEF (2017) describes digital competence in five areas: information, communication, content creation, security and problem solving. Where the information area is made up by the navigation and search competencies; evaluation; And storage and retrieval of information.

Adequate participation in the Knowledge Society requires innovative teacher training proposals. Several authors have pointed out that technologies alone do not generate changes or educational improvements (Marques, 2013, Area, 2008, Kiridis, Drossos and Tsakiridou, 2006). Hence, the need for educational institutions to provide powerful teacher training programs that encourage teachers to innovate, rethink practice and change their teaching strategies (Pozuelo, 2014). However, research by Badarch, Knyazeva and Lane (2012), Cook, Smith and Tankersley (2012), Ertmer and Ottenbreit-Leftwich (2010) and Tejedor (2007) indicate that there is still a lack of teacher training in digital skills they can be able to connect their knowledge with practice.

There is a methodology that develops digital information competence and leads to the design and implementation of innovative teaching practices. Educational innovation based on evidence methodology (EIBE) is used to support professional educational decisions in scientific evidence (Tejedor, 2007, Ramírez, 2012). Tejedor (2007) points out that in order to innovate in one's own teaching practices, it is necessary to base information on good practices available on the network, in reliable sources of information. Therefore, as indicated by Ramírez (2012), the teacher must demonstrate information search, critical reading and project development and implementation skills in order to put knowledge into practice through research strategies supported by digital competencies. Thus, EIBE includes the design of innovative proposals with the phases of: (1) establishing the object of innovation, (2) seeking information, (3) formulating the project, and the implementation of innovative proposals with the phases of (4) promulgation and evaluation; and (5) diffusion (Sarango-Lapo, Mena y Ramírez-Montoya, 2016).

2. THESIS STATEMENT.

Problem statement

There seems to be a lack of teacher training in digital skills to be able to connect their knowledge with practice (Badarch, Knyazeva and Lane, 2012; Cook, Smith and Tankersley, 2012; Ertmer and Ottenbreit-Leftwich, 2010 and Weaver; 2007). The EIBE model could be an alternative, since its application demands in the teachers certain informational skills for the design and implementation of innovative teaching proposals.

Research objectives

The research objective is to investigate the level of perceived domain of informational digital competence after receiving training in the design - oriented EIBE model (phase 1 - 3) and the implementation of innovative proposals (phase 4 and 5).

3. METHODOLOGY.

The research methodology used was exploratory-descriptive (Johnson and Gosling, 2010). This methodology investigates the level of perceived mastery of informational digital competence by teachers after receiving the EIBE course oriented to the design and implementation of innovative teaching practices. The digital competences of information were measured, according to the model proposed by INTEF (2017), they are the ones of navigation and search; evaluation; storage and retrieval of information and added the competence of communication of the information in coherence with the diffusion phase of EIBE. To do this, we used an online questionnaire with likert scale of five response options (no domain, little domain, regular domain, good domain, excellent domain); And a semi-structured interview was also conducted to determine what digital information competencies were necessary to apply during the design and implementation of innovative proposals according to EIBE.

Sample

A total of 96 teachers participated in the virtual course "Learning Management Models" of a postgraduate program, of which a sample of 39 teachers completed an online questionnaire to measure the level of perceived domain of digital competence in the information area. The virtual course was given by the "Instituto Tecnológico de Monterrey" (ITESM) for four months in 2016.

Data collection

Data were collected from six questions from an online questionnaire that was applied to teachers who participated in the virtual course. The first three questions relate to competition on "navigation and search for information", the fourth question relates to the competition on "information evaluation", the fifth question has to do with competition "storage and retrieval of information" And the sixth question with the competence of "communication of information ". Other data were collected from the questions of the semi-structured interview to determine what digital information competencies were required in the design and which in the implementation of innovative proposals according to EIBE.

Analysis of data

At the end of the virtual course the teachers answered the online questionnaire questions and the interview questions. From the questionnaire, six questions were analyzed, adapted from the model proposed by INTEF (2017) of the information area. From the interview the questions analyzed led to know which competencies applied in the design and implementation phases of innovative proposals with EIBE.

4. RESULTS.

The main results indicate the level of mastery perceived by teachers of digital information competence in the design and implementation of innovative proposals with EIBE. The teachers in the virtual course needed to find information that substantiates their proposals of virtual end of course.

Table 1 presents the levels of perceived dominance over informational digital competence.

<i>Digital informational competences</i>	<i>Question</i>	<i>Domain Levels</i>									
		<i>No domain</i>		<i>Little domain</i>		<i>Regular domain</i>		<i>Good domain</i>		<i>Excelent Domain</i>	
		<i>F</i>	<i>%</i>	<i>F</i>	<i>%</i>	<i>F</i>	<i>%</i>	<i>F</i>	<i>%</i>	<i>F</i>	<i>%</i>
Navigation and information search	Browse the Internet	0	0	1	2.6	5	12.8	26	66.7	7	17.9
	Use keywords and operators.	0	0	3	7.7	7	17.9	25	64.1	4	10.3
	Select information based on search purposes and verify your license	0	0	1	2.6	8	20.5	26	66.7	4	10.3

Evaluation of information	Critically evaluates the results of information found	0	0	0	0	7	17.9	26	66.7	6	15.4
Storage and retrieval of information	Stores information on open access sites.	5	12.8	10	25.6	16	41.0	7	17.9	1	2.6
Communication of information	It transmits information in written and verbal form using the technologies	0	0	2	5.1	7	17.9	24	61.5	6	15.4

Tabla 1: Level of domain of the digital informational competence

As seen in Table 1, the results in the Navigation and information search competition show that between 64.1% and 66.7% of teachers indicated that they have "good command" in Browsing the Internet, using keywords and selecting information depending on the purposes of search ". Followed by a percentage of 12.8% to 20.5% of teachers who are perceived in "regular domain", while in a percentage of 10.3% to 17.9% they are located in "excellent domain", finally in a percentage of 2.6% to 7.7 are perceived with "little dominion".

Regarding the results of the Information Evaluation competency, 66.7% of teachers were in "good domain" regarding to critically evaluate the results of the information found, and only 15.4% of teachers indicated that they are in level Of "excellent mastery", while 17% of teachers are in regular domain.

The results of the information storage competition indicate that only 17.9% of teachers are in "good domain" in terms of storing information on open access sites, while from 12.8% to 41.0% of teachers are located between "no domain" to "regular domain" and only 2.6% is perceived as "excellent domain".

The results of the competition of information communication, 61.5% of teachers are perceived as "good" in terms of transmitting information in written and verbal form using the technologies, in a 17.9% is located in "regular domain" , 15.4% are at "excellent domain" level and only 5.1% of teachers are perceived in "little domain".

Table 2, presents the results obtained from the semi-structured interview to five teachers, aimed at determining the competencies that were applied in the design and implementation dimensions of the innovative proposal that includes the phases of the EIBE model.

<i>Dimensiones EIBE</i>	<i>Phases of EIBE</i>	<i>Digital informational competences</i>	<i>F</i>	<i>%</i>
Proposal design	Theme Selection	Communication of information	4	80
		Navigation and information search	2	40
		Storage and retrieval of information	5	100
	Formulation	Communication of information	5	100
		Storage and retrieval of information	5	100
		Evaluation of information	5	100
Proposal implementation	Promulgation and evaluation	Communication of information	5	100
		Storage and retrieval of information	5	100
	Diffusion	Communication of information	5	100

Table 2: Application of digital information competence in the phases of EIBE

Table 2 shows that for the design of proposals in the "theme selection" phase, 100% of the respondents indicated necessary information storage and retrieval skills due to the fact that they handled google drive or dropbox. In contrast to the results of the "innovative proposal formulation", where 100% of teachers demonstrated communication skills, information assessment, information storage and retrieval information, in the meetings held, during selection of the information, supporting the proposal and in the management of technological tools for the elaboration, storage and recovery of the proposal. Likewise, 100% of teachers pointed out the importance of communication and information storage skills for the implementation of the proposal in the phases of enactment and diffusion.

5. IMPLICATIONS/DISCUSSION.

Design of innovative proposals

The EIBE model leads teachers to the development of digital information competencies in the design of innovative proposals that enhance the processes of teaching learning. The results indicate that the majority of teachers perceived in general to have a "good command" in the digital informative competitions of navigation and search of information, of communication; And evaluation of information, necessary to support the selection of the topic and the formulation of the innovative proposal (Tejedor, 2007). What, in coherence with what Ramirez (2012) and Mena, Ramírez y Rodríguez (2017) indicates, the

teacher must be able to demonstrate information search, assessment and project development skills in order to put knowledge into practice, supported by research strategies and digital competences. However, it is necessary to strengthen the information storage and retrieval competence, as the results indicate that there is a "regular domain" in most teachers, this may be because they have a superficial knowledge about the management and possibilities of access sites that allows to store and retrieve information individually or in groups, so that their integration or use varies depending on the training they receive (San Nicolas, Fariña and Area, 2012).

Implementation of innovative proposals

The results indicate that it was indispensable to apply the information communication competence. These competences were perceived at a level of "good mastery", since in the implementation phase of the innovative proposal it was necessary to communicate verbal and written by different technological means, both in the promulgation and in the diffusion of the results , Taking into account that for their diffusion it was necessary to look for sites where they can publish the results as magazines, congresses, books, panels of experts, etc., which according to Pozuelo (2014) and INTEF (2017) teachers must be prepared to know how to manage and communicate information.

The results generally indicate a good level of perceived mastery of digital information competencies in teachers, so it could be said that for the design and implementation of innovative projects EIBE the appropriate use of technology is required to promote the search, evaluation, storage and diffusion of information (Hepp, Prats and Holgado, 2015). However, it should not be forgotten that the integration of technology in innovation proposals depends very much on the establishment of good training programs (San Nicolas, Fariña and Area, 2012) and those aimed at linking knowledge with practice (Tejedor, 2007 and Ramirez, 2012)

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