
This is the **accepted version** of the conference paper:

Espasa, Anna; Guasch, Teresa; Álvarez Valdivia, Ibis Marlene. «A methodological approach to identify teacher's ICT competencies in online learning environments in Higher Education». 13th Biennial Conference. Earli. Amsterdam, 25-29 August, 2009, paper 2.

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Paper 2: A methodological approach to identify teacher's ICT competencies in online learning environments in Higher Education.

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Abstract

This paper aims to describe the methodological process of identifying and measuring the teacher's and the teacher trainer's ICT competencies in an online learning environment in Higher Education undertaken within the framework of the European Project *Elene-TLC*.

Reviewing the research on the online teacher's competencies demonstrates that, firstly, the method that is most frequently utilized to identify these competencies is the focus group. Secondly, the Delphi technique is the most frequently used technique to gather experts' consensus on which are the top competencies for the online teacher among the ones identified.

The methodological proposal described in this paper consists in the creation of 7 online focus groups whose objective was to identify the online teacher trainer's competencies and those of the online teacher. The list of competencies obtained thus was

subsequently given to the European experts participating in the application of the Delphi technique. These experts were asked to order the competencies according to their degree of importance.

Results show that online focus group and Delphi method are appropriate methodologies to identify ICT university teachers' competences in online learning environments

Extended summary

Background and aims

This paper aims to describe the methodological process of identifying and measuring the teacher's and the teacher trainer's ICT competencies in an online learning environment in Higher Education. Our contribution bears within the European Project Elene-TLC which was founded by the European Commission (January 2007 to December 2008) and was carried out by 9 universities (http://www.elene-tlc.net/Project_description).

From the literature reviewed, the term competency has been subjected to multiple interpretations. In general, there are two clear approaches: one viewing competency as a personal skill or ability, linked to behaviour efficiency (Eraut, 1998; McClelland, 1998; Spencer and Spencer, 1993), and another approach which understands competency as strategic behaviour, linked to the possibility of adjusting performance to the context demands. In our opinion, the latter approach seems more suited to refer to teacher competencies, whose exercise must unavoidably respond to the peculiarities of their given educational context. Accepting the social nature of competencies implies that it is the actors, and their expectations, who determine and shape the content of the competencies required to successfully perform in specific professional contexts (Eraut, 1998; Gonzi et al., 1993; Westera, 2001). Taking this into account, we adopted an operative concept as defined by Eraut (1998) and DESECO (2002), who essentially define a competency as a system of complex actions including the knowledge, abilities and attitudes required for the successful completion of tasks. This configuration as a whole can be summoned to act effectively on certain demands from social practice, that is to say, external social demands, capabilities, individual disposition and context are all part of the complex nature of competencies.

In general terms, the literature reviewed assert that university teachers' roles in virtual learning environments are derived from traditional teachers' functions. However, clarifying teachers' roles is necessary. The competencies calling for these roles within the particularities of the tasks university teachers carry out in online learning environments also need to be specified.

Research design

In order to satisfy the above mentioned needs, literature on the analysis the competencies displayed by the teacher and/or the teacher trainer using ICT was reviewed. The methodology in most of the reviewed studies was based on two techniques, the focus group and the Delphi method (Williams, 2003; Klein, Spector, Grabowski, and De la Teja, 2004; Marshal and Akdere, 2005). This is the reason why it was used both techniques to identify and prioritize the competencies exploited by a teacher in an online teaching and learning environment.

A focus group is a type of interview commonly used to define the research topic and the research questions. A focus group can be implemented both to explore and confirm, and is particularly effective for collecting data about attitudes, perceptions, opinions. A focus group can be especially useful to outline the complexities of an issue, but also for evaluating purposes, to identify strengths, weaknesses, and needed improvements (Anderson and Kanuka, 2003).

Within the framework of our research, first of all, 7 net-based focus groups were simultaneously run in different European universities in order to identify and define the competencies of university teacher and the teacher trainer who work in an online learning environment. The 70 participants in the focus groups were university teachers and university teacher trainers coming from 16 European universities. They all met the criterion of being experienced in the application of the ICT to Higher Education (teachers, with at least 2 years' experience in the university teaching environment using ICT. Teachers' trainers, with at least 2 years' experience on the topic: pedagogical use of ICT in Higher Education).

Two types of focus groups were organized. One was constituted by the teachers. The other was constituted by the teachers' trainers. The participants in both types of groups were asked to find the answer to two questions. The first was about competencies: *which competencies do you consider that higher education teachers/teachers trainers should have for teaching with ICT?* The second question was about methodologies: *which teaching and learning methodologies do you consider good experiences for the design of practices that favour the development of these competencies?* They discussed the answers in an orderly manner during a fortnight with the help of a moderator.

The participants in the focus groups posted their contributions to the discussion in an asynchronous online platform. These contributions were processed and analysed to identify both the competencies to use ICT needed by the two targeted kinds of professionals- the teacher (N=40) and the teacher trainer (N=30), and the methodologies that the participants considered to best suit online teaching and learning processes. Each discussion group ran for around 15 days.

After finishing the work with the net-based focus groups, the Delphi method was applied to obtain a 78 European experts' agreed prioritization of the roles, competencies and tasks needed by the teacher and the teacher trainer. These 78 experts were selected to participate in the Delphi technique because they met all the criteria previously established by the researchers, which were *s/he must have made a noteworthy contribution to the field through writing on research journals, s/he must have at least three years of experience in the innovative use of ICT in university teaching, s/he must be able to read and write in English, and s/he must be willing to participate*. The experts selected were asked to answer an online questionnaire designed from the results obtained with the focus groups.

In order to reach a consensus, we asked the experts to answer the questionnaire in two rounds. The questionnaire was structured by the following information areas:

- Current teacher functions for ICT supported teaching and learning.
- The specific competences that demand new teacher' functions.

- Tasks that teachers should do and problems they may face up to in ICT supported teaching and learning.
- Teacher training needs to improve teaching with ICT in Higher Education.
- Methodological criteria for designing teacher training practice to improve the teachers' competences for teaching with ICT in Higher Education.

The experts were asked to prioritize the proposed statements in the first. The first-round questionnaire was aimed at measuring, with a Likert scale (1-5), the relative importance assigned by the experts to the proposed statements, which were about the definitions of roles and competencies associated with these roles. The results obtained from the first round enabled the researchers to refine the statements. In the second, the goal was to obtain an agreement by consensus. Taking into account the agreement reached in the first round, in this second questionnaire experts were presented with a list, ordered according to importance, of roles and associated competencies teachers must have in order to perform using ICT. For this second proposal, roles and competencies were redefined, respecting the experts' comments, which were reiterated and better argued.

Results and conclusions

The results obtained by using the Delphi method enabled us to define an ICT competency framework for teachers and teachers' trainers, which is currently being validated through designing and implementing Professional Development Activities developed at an European level. The ICT competency framework is made up by five roles which are: designer-planning, social, cognitive, technological and managerial. However, these are not the results to be presented, but rather the methodology to reach the competency framework. Results show that online focus group and Delphi method are adjusted methodologies to identify ICT university teachers' competences in online learning environments.

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