eLene-TT

Criteria for ICT-supported Higher Education Teachers Training

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Introduction

This document aims to gather theoretical and practical contributions about teaching training practices that incorporate and promote the use of ICT in order to define criteria for the design of Higher Education Teachers Training[1] with ICT.

The analysis of the changes that suppose the ICT in the processes of teaching and learning in Higher Education has been the focus of different investigations in the last years. These works show that the teacher must reconceptualize their role as a teacher and create a set of situations and reward structure that encourage students to look upon their interactions with their peer as valuable resources for learning (Coppola, Hiltz & Rotter, 2002; Sanyal, 2001).

In order to cope with the fundamental changes that are challenging education communities today, especially with the integration of ICT, it is necessary to consider that ICT is not only a tool or technological resource, but that it is also introducing new learning paradigms. Educational actors, students, teachers, trainers, administrators, etc. need to be empowered through inclusive ICT education policies, which address the broad scope of learners and communities. Teachers' education appears as one of the most important field for addressing the integration of ICT in education. Teacher training should be done "in situ" with a view to the specific educational issues and problems that the teachers have to face. Learning in a technology enhance environment - e-learning – should not be confused with learning about technology. Teacher trainers' policies must go beyond technical skills and empower all educational actors by developing new competencies for teaching and learning with ICT (Progress Report, European Commission for implementation of Education and Training 2010" work program, 2003).

On the other hand, it is necessary to advance in the clarification of the organizational, instructive and technological functions that supposes the teaching in this new educational paradigm and, on this base, to think about the formative needs that these changes imply. It is particularly important to obtain consensus in relation to the teaching function and teaching competences for instruction supported on ICT. In the consulted literature, we have found many different conceptualizations i.e. Gonzi, Hager & Athanasou, 1993, Eraut, 1998; Salmon, 2000, Goodyear, Salmon, Spector, Steeples & Tickner, 2001; Westera, 2001; Anderson, Randy, Andy, Garrison & Archer, 2003; Willian, 2003).

For this reason, the first intention of this work (WP1) was to delimit how teachers' role and competences for teaching and learning supported on ICT should be understood and, on

[1] Teacher is the learner that participates in the training process.

this base, to define the criteria that should guide the development of these competences in teacher training actions.

In order to obtain this proposal two research procedures have been integrated:

a) Systematised analysis of current theorists was made. Analysis of literature about the introduction to ICT in teaching and learning environments of higher education (Chikering & Gamson, 1987; Fox & Helford, 1999);

b) An analysis of documentary sources on several university pedagogical environments was made in order to contrast such theoretical assumptions, and to enrich the previous analysis. They were referred to the design of pedagogical practices that are promoted. A template was elaborated in order to guarantee the necessary homogeneity in the documentary sources. The contents refer to Information about context (Institution; Department/ Studies); description of learning environment; previous knowledge (technology and pedagogical); objectives of learning; content; activities; assessment process (includes the follow up and feedback); learning resources; methodology; teachers' role and learning products Also, the expectations and experiences of a significant number of academic staff have been analysed. This information was related to "teachers training needs and experiences from the teachers", referring to characteristics of the group: previous training of a didactical use of ICT; previous knowledge; previous experiences on teaching and learning using ICT; teachers' uses of ICT; teachers' training needs to improve the use of ICT in their teaching practice and students' information.

The logic followed in this previous investigation leads us to display the criteria in theoretical and practical principles, so that they can base and guide the training proposals for those university academic staff that participate, or wish to participate, in educational experiences enhancing ICT applications.

Criteria for ICT-supported Higher Education Teachers Training

Training ICT for teachers should be adjusted to their individual qualifications and sometimes integrated with the work of developing the whole course. It is also recommended to start from the teachers own situation, and use it to improve the quality of their performance. In this section we define and explain the criteria that consider guiding training proposals.

We conceptualise a **criterion** as **an indicator or principle that guides on how to take decisions on the design of teacher training practices**. In this sense, we think that these outcomes can contribute to clarify, facilitate and make coherent the design of Higher Education Teachers Training with ICT.

In order to facilitate the comprehension of the criteria, **we have related each criterion with the guideline that specifies and details how to proceed**. We consider that the criteria should **facilitate the design** of ICT-supported Higher Education Teachers Training actions, but also **assess the development** of the TT actions, with the aim of regulating and introducing changes on them; and the guidelines should **help on the development of these TT actions**.

CRITERION 1. TEACHERS TRAINING ACTIONS GOALS SHOULD BE TO DEVELOP COMPETENCIES

Competence is defined as the complex system actions that integrate knowledge, practical skills, attitudes, value orientation, emotions and other social behavioural component that together can be mobilized for effective action. Competencies, on the other hand, may be demonstrable in contexts. External demands, individual capacities or dispositions, and context are all part of the complex nature competence. So competency is a combination of attribute underlying some aspect of successful professional performance. This implies that a performance context, rather than an education context, is needed for such integration to take place thus emphasising the closeness of competence to performance rather than its separation (i.e. Eraut, 1998; DESECO, 2002).

Taking into account this approach about competence notion, other references were consulted that clarify it in relation to the learning and teaching on virtual environments (i.e. Bates & Poole, 2003; Campbell 1998; Coppola, Hiltz & Rotter, 2002; Jonassen, Peck &

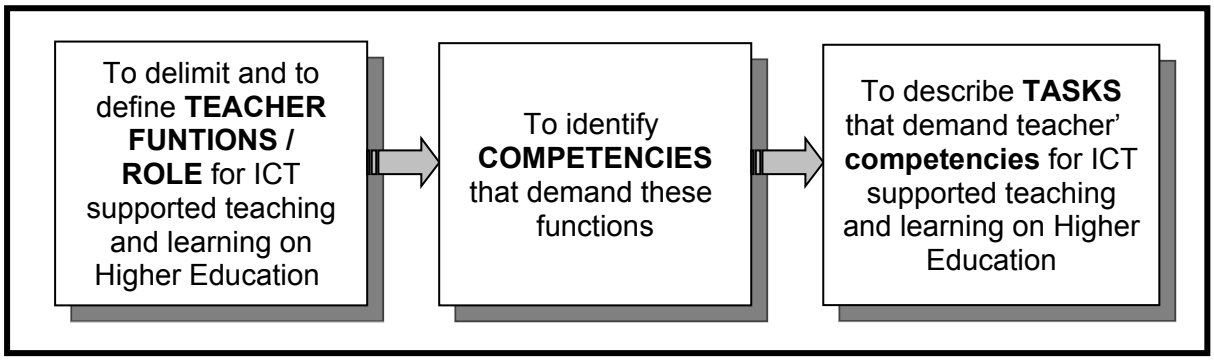
Willson, 1999; Laurillard, 2002; Moore & Anderson, 2003; Salmon, 2000; Trill, 2001; Westera & Williams, 2003). In general, we found coincidences in the sources consulted. The authors consulted consider that the teacher' functions on learning and teaching processes that include ICT resource are derived from the traditional teacher' functions (Coppola, Hiltz & Rotter, 2002). Nevertheless, diverse definitions can be found and this imprecision suggests specifications in order to clarify the interrelation between functions, competencies and task on educational environments that include ICT. i.e. What tasks demand specific competences and to what specific teachers' role makes it reference to?

In order to achieve this flexibility, interrelationship has to be seen at three levels:

1. The specific competences that demand new teacher' functions.
2. Current teacher functions for ICT supported teaching and learning.
3. Tasks or problems that teachers should make or face in ICT supported teaching and learning .

The interdependence that exists between these concepts can be seen in the following figure.

Figure 1. Links between functions, competencies and tasks



On the other hand, the theoretical analysis about this question allow us to identify that teaching through the use of ICT must favour the development of the three teacher's roles, which are not exclusive with each other, but overlapped with each other in the academic practice: Designer/planning role; Social role; Cognitive role. Teachers training practice should also develop two teachers' profiles for teaching with ICT: Technological competencies; Management competencies.

These competencies are cross-sectional related. In the following chart (figure 2) we try to show the transversal function not only of this profile but also of the ***management competences*** in the development of the teachers' role in e-learning environments. To emphasise the learning of the competences that shape the ***technological profile*** in relation with the peculiarities and demands of teaching functions in pedagogical environments with ICT applications.

The application of these competences is cross-sectional to all the practices of the academic staff with application of ICT; hence, it does not have to be learnt as an independent complement in the teaching function.

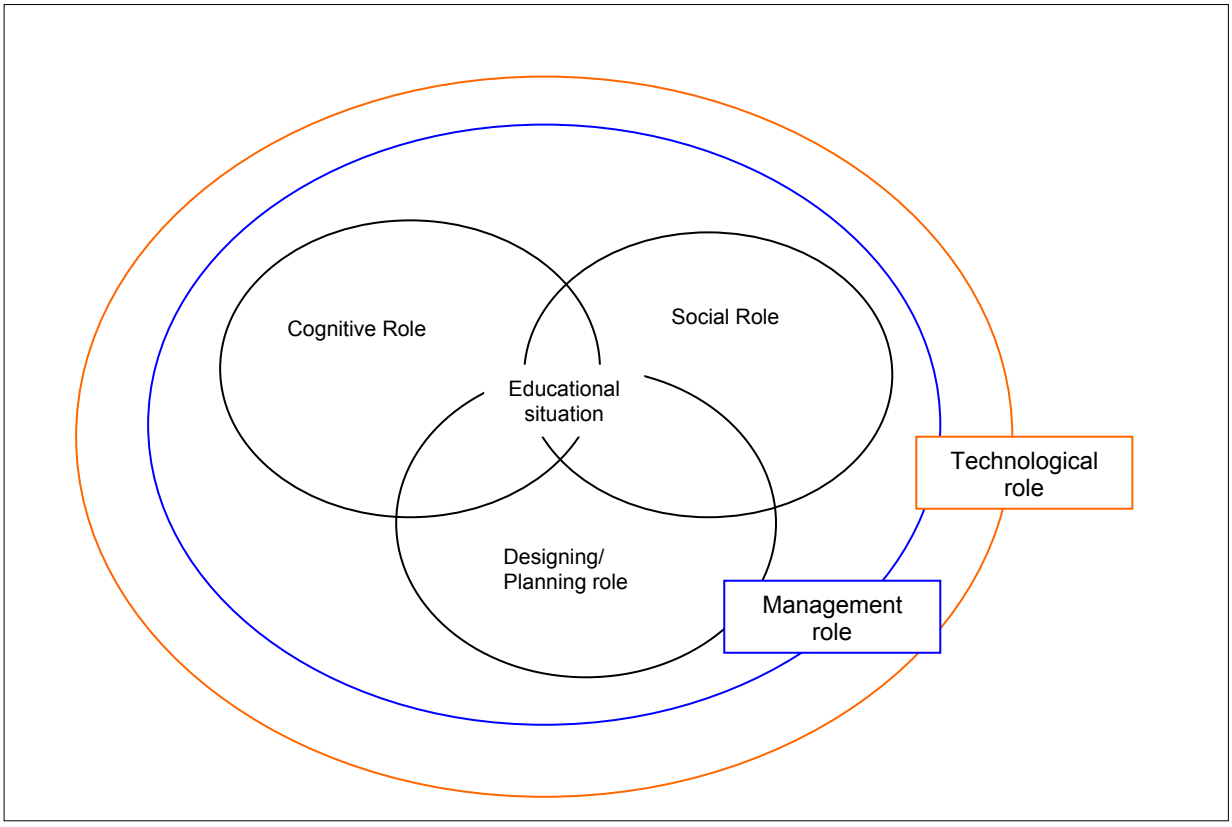


Figure 2. Teachers' roles in learning environments with ITC applications.

Each role is formed by a whole of necessary competencies to carry out the actions/tasks that each role demands and that would only have sense if they are related in a systematic form as shown in the figure. We must bear in mind, though, that the competencies may vary according to the context in which they are applied (see appendix 1). This approach can help us in the design of learning situations based on tasks in which the teachers can develop competences under the concept of learning by doing.

Example:

Guideline related to this criterion:

"Professional Development"

(we consider that specifically this guideline should be reviewed in order to take into account some aspects described on this criterion)

CRITERION 2. TEACHERS TRAINING PRACTICE SHOULD BE DESIGNED USING SCAFFOLDING PRINCIPLES FOR ACTIVE LEARNING

2.1. Learning objectives:

- To anticipate that to learn in an active way demands a significant time and effort from the learner's part.
- Learning objectives must involve intellectual challenges that require judgement and a complex whole of tasks that should help beginners to try out how to operate among the complicated ambiguities of the professional world (i.e. Creating material that is slightly too difficult for the student, encouraging cognitive "stretch".)
- It is more important to attribute meaning to the knowledge and apply it rather than recognise it, reproduce it or widen it.

2.2. Learning content

- The contents of the learning require accuracy with the context.
- To use problems that require the learner to understand and manipulate course content; to present content in its complexity, i.e. real world content.

2.3. Learning activity

- To conceive activities through the development of real tasks, i.e. answers to problems, studying cases, design and development of projects, etc.

- Learning should be situated and should promote authentic educational situations. It is required that learners act in an effective way with the acquired knowledge (learning by doing).

  i.e. to perceive the reality, represent it, contrast it, give sense to it, reconstruct it, act, work on it, assess it, , etc.

- To create opportunities for high levels of interaction (knowledge is built on interactive processes: learner-teacher, learner-learner, learner-content).
- To conceive the social mediation role in the learning process (guided learning; collaborative learning; tutoring, coaching thematic reflection, etc.).
- To conceive the learning situation as a "social dialogue": familiar climate, accompaniment, interchange, personal support availability (i.e. learning guidance, tutoring, coaching) and personalised or technologic support (i.e. Tutorial, Learning monitoring, Learning Management System (LMS), Computer Supported Collaborative Learning (CSCL); Basic Support for Cooperative Work (BSCW); IQ Form; Question mark perception.

2.4. Assessment learning process

- To implement procedure for authentic assessment (group assessment, peer assessment, self assessment, assessment in problem basic learning, learning portfolio, etc.)
- To assess and update constantly the assessment tasks.
- To provide a fitting feedback at the moment the learner needs it; avoiding, this way, a possible lack of motivation during the learning process and major resistances in the use of ICT in their teaching practice.
- The learning must be evaluated in practical contexts and as tasks.
- To offer an integrative formative assessment through the course.
- To guarantee the validity and reliability in the judgements setting suitable criteria in order to assess and/or evaluate the achievements (results).
- To try to verify if the learner can express justifiable answers and generate products or estimated tries as satisfactory.
- The validity of the results (achievements) depends, to a great extend, on whether the capacity to act suitably in the real world is expressed or not.

Example:

Guidelines related to this criterion:

- **Assessment process**
- **Interaction, communication and collaboration**
- **Content and learning objectives**

CRITERION 3. TEACHERS TRAINING SHOULD BE ADAPTED TO THE DIFFERENT DELIVERY SYSTEMS

- Practices should pay attention to using the appropriate ICT-based learning models (face-to-face, blended supportive, blended complementary, fully online)
- As far as an active learning is demanded, models of practice should respond to the learning models teachers are going to develop in the classrooms.
- Practices should introduce the use of different technologies to give teachers the opportunity to choose those which would fit better to their subjects and matters.

Example:

Guideline related to this criterion:

- **Tools and resources**

& Tools and resources of WP2

CRITERION 4. TEACHERS TRAINING SHOULD RESPECT DIVERSE TRAINING / LEARNING

- To attend the variety of educational needs of the academic staff: In a formative practice, to promote the integration and use of the ICT, in a relative frequency …, may gather learners with different levels of previous knowledge of ICT. This must be regarded as a starting point in order to guarantee the effectiveness of the teaching and learning process. In the same way, attitudes and expectations on learning should be taken into account.

- To recognize there may be no “right” answer to a given question, and emphasize cognitive flexibility.
- The design of activities and resources, etc.., must fit the needs and possibilities of learners.
- To accept as a learning goal the diversity among the results of learners. Not to expect common results in the activities of study.
- Gender issues, social and cultural aspects and equality of opportunities policies should also be taken into consideration when designing teachers’ training practices.

Example:

Guideline related to this criterion:

- **Learning style**

CRITERION 5. TEACHER TRAINING PRACTICES SHOULD BE EVALUATED

When we refer to the evaluation course, we understand it as the value judgements that educational process participants (i.e. teachers, students, faculty members…) do about some developed course indicators that should be assessed (Salemi, Saunders & Walstad, 1996).

- In order to obtain the participants feedback of the course we consider that we have to contemplate the evaluation process in the design of teacher training practices through ICT.
- This feedback lets us know the satisfaction degree of the participants and therefore adjust and improve the course design.

Nowadays researchers and experts have designed many evaluation instruments which its main function is to value the potentialities and/or the development of the course (Reeves, 2001; Elissavet & Economides, 2003).

Example:

See outcomes of WP5: evaluation

CRITERION 6. TEACHER TRAINING PRACTICES SHOULD CONSIDER INSTITUTIONAL ENVIRONMENT

- Structural frame.
- Human frame.
- Political frame.
- Symbolic frame.

Example:

Guideline related to this criterion:

- **Institutional environment**

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Appendixes

Appendix 1: Proposal of teachers' roles, competences and examples of tasks.

Role	**Competencies**	**Examples of tasks**
Designer/ Planning Role	Planning	Defining the procedures of instructional design: contents, resources, communication and assessment in virtual context.
	Organizational	Present content/questions. Establishing time parameters Drive a virtual classroom and the shared area of files / Modifying configuration files.
Social Role	Group process	Setting climate for learning Drawing in participants; Prompting discussion
	Collaboration	Management cooperative interactions among students. Management the online interaction with distant learners through its synchronous activ. (live lessons, homework and virtual labs. Identifying areas of agreement/disagreement; Negotiation/ Seeking to consensus/understanding, encourage. Acknowledging or reinforcing student contribution.
	Interpersonal communication	Interaction on web: Debate on web, Visit of an expert by web; Web reading club, etc.; Communication in the virtual room (Visible and non-visible processes); Identify misconceptions Questioning Confirm understanding through assessment and explanatory feedback.
	Writing	Writing message or text, create online interactive contents. Translation of traditional contents in online contents with interactive activities for students.
Cognitive Role (Expert on the learning content)	Knowledge of distance learning and e-learning	Providing in practice strategies about how to drive a virtual classroom Tutoring in a distance learning environment over the Internet. Didactic organization (learning guidance; effectiveness of live synchronous interactions, homework and virtual labs).
	Knowledge learning theory student-focused	Know aspects of collaborative, active, constructive, reflective, authentic learning;
	Evaluation skills	Validation of knowledge acquired by web-assisted learning. Assess the efficacy of the process. Evaluation the influence interaction on web in the constructions of meaning and knowledge / Evaluation of web-based teaching.

Role	Competencies	Examples of tasks
Technological profile	Basic technology knowledge	Technological access knowledge; Word processing, PowerPoint presentations, Use of Internet and e-mail and the use of audio and video devices.
	Knowledge of support services	Functionalities into virtual campus, styles of virtual communication. Use of applications of virtual campus on web-based teaching. Tools of on-line platform usable for tutoring. Establishing working with ICT in campus and flexible courses. Applications and resources (i.e. Learning Management System - LMS); Planning tools for use in shared space.
	Multimedia Knowledge and Software skills	Design pages. Information graphics: planning, reporting and execution Typography works Headline writing and typographic display Use text editors Data analysis skills Knowledge of intellectual property and fair use and copyright regulations

Role	Competencies	Examples of tasks
Managerial profile	Project Management skills	- Management of a virtual learning environment (synchronous & asynchronous). - Management of the shared mail boxes. - Inject knowledge from diverse sources (e.g. textbook, articles, internet, personal experiences).