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University teaching in the 2.0 era: virtual campus teaching competencies

Dr Mª Esther del Moral Pérez

emoral@uniovi.es
Professor of New Technologies Applied to Education, University of Oviedo

Dr Lourdes Villalustre Martínez

villalustrelourdes@uniovi.es
Lecturer in New Technologies Applied to Education, Department of Education Sciences, University of Oviedo

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Abstract

The rise of the information technology society and the advent of the Web 2.0 phenomenon in university education contexts have brought about a profound shift in the functions of teaching staff. The teaching and technology training of such staff is becoming an imperative need in order to cope with the challenges of new teaching-learning situations generated in virtual settings and/or with the support of technological tools.

This article describes the *teaching, technology and tutoring competencies* that 2.0 lecturers should have, given the fact that they undertake their tasks in technology-mediated environments. These tasks are directly related to aspects inherent to the adopted instructional model, to the context and to the new mediating tools. Student guidance, the capacity to design motivating multimedia materials and the formulation of collaborative activities are but some of some of the forms that these professional competencies take.

After surveying 70 lecturers and more than 840 students at the Spanish universities belonging to the *Campus Virtual Compartido del G9* (a virtual campus comprising the universities of Cantabria, La Rioja, Extremadura, Oviedo, the Balearic Islands, the Basque Country, Zaragoza and Castilla-La Mancha, and the Public University of Navarre), the lecturers strengths and weaknesses were highlighted and the most pressing training needs were underscored, in keeping with the demands of European convergence plans.

Among the strengths mentioned by the lecturers and the students involved in the virtual education processes were the proper formulation of activities that foster learning, the variety of teaching resources used, content interactivity, etc. The main weaknesses were the lack of effective proposals for practicals that promote collaborative learning through participation and interaction among all students, and the lack of personalised comments of support and encouragement in relation to the students' learning progress.

Keywords

Didáctica universitaria en la era 2.0: competencias docentes en campus virtuales

Resumen

La pujanza de la sociedad de las tecnologías y de la información, y la irrupción del fenómeno de la web 2.0 en los contextos formativos universitarios han provocado un profundo viraje en las funciones que deben desempeñar los docentes. La capacitación didáctica y tecnológica del profesorado se está convirtiendo en un imperativo para hacer frente a las nuevas situaciones de enseñanza-aprendizaje desarrolladas en escenarios virtuales y/o con el apoyo de herramientas tecnológicas.

En el presente trabajo se enuncian las competencias didácticas, tecnológicas y tutoriales que deben definir al docente 2.0 que desempeña sus tareas inmerso en entornos tecnológicos, las cuales están directamente relacionadas con aspectos intrínsecos al modelo instructivo adoptado, al contexto y a las nuevas herramientas mediadoras. Esas competencias profesionales van a plasmarse en la orientación dispensada a los estudiantes, en su capacidad para el diseño de materiales didácticos multimedia motivadores, en la formulación de actividades colaborativas, etc.

Tras encuestar a 70 docentes y a más de 840 estudiantes pertenecientes a las universidades españolas que integran el Campus Virtual Compartido del G9 (Cantabria, La Rioja, Extremadura, Oviedo, Pública de Navarra, Baleares, País Vasco, Zaragoza y Castilla-La Mancha), se ponen de manifiesto las fortalezas y debilidades detectadas en los docentes, y se subrayan las necesidades formativas más acuciantes, en consonancia con las demandas suscitadas por los planes de convergencia europea.

Entre las fortalezas señaladas por docentes y estudiantes –implicados en procesos formativos virtuales– destacan la correcta formulación de actividades que ha propiciado el aprendizaje, la variedad de recursos didácticos utilizados, la interactividad de los contenidos, etc. Y, como principales debilidades, la falta de propuestas efectivas de prácticas que promuevan un aprendizaje colaborativo a través de la participación e interacción entre todos los estudiantes, y la escasez de comentarios individualizados de apoyo y ánimo en relación a sus progresos en el aprendizaje.

Palabras clave

Introduction

It is clear that one of the new functions of teaching staff is the effective integration and incorporation of teaching media in order to optimise learning. Teacher training and development aimed at using and handling ICTs is therefore one of the key ways of ensuring such integration (Del Moral & Villalustre, 2010).

This new teaching profile will almost certainly involve the espousal of change from the point of view of being open to innovation by incorporating new technologies and Web 2.0 tools as resources that contribute to the optimisation of the teaching-learning process in universities.
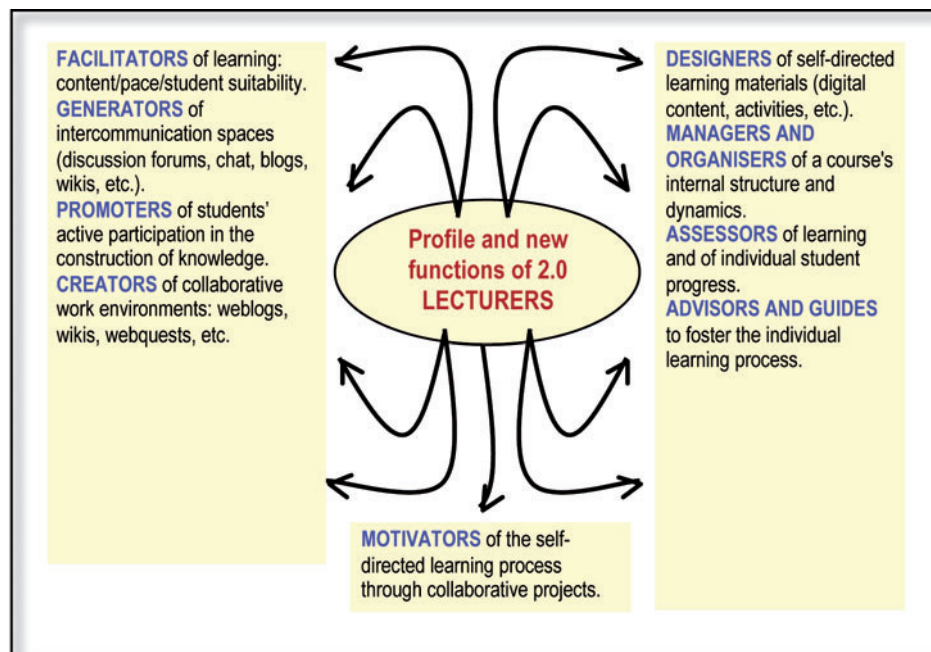

Figure 1. Profile and new functions of 2.0 lecturers (Del Moral & Villalustre, 2004)

Consequently, besides their traditional lecturer, tutor and researcher functions, university lecturers will need to add a fourth ICT expert function that enables them not only to use Web 2.0 tools and applications as yet another teaching resource in the classroom, but also to undertake their own teaching duties in new virtual settings.

Moreover, with the advent of new learning contexts that are supported by Learning Management Systems (LMSs), together with the university environment's advocacy (within the new European Higher Education Area, EHEA) of teaching formulas that combine face-to-face and e-learning (blended learning), 2.0 lecturers are required to know how to undertake their professional activities in these new virtual settings, not only to make full use of the opportunities that the tools they contain offer, but also to discover the potential they hold in terms of fostering learning. However, it is worth recalling the fact that students must be central axis of the education process; a process that shall necessarily be oriented towards fostering the acquisition and strengthening of their capacities and abilities, as concluded in the research coordinated by Del Moral (2007) and funded by the Spanish Ministry of Education and Science, later published in Del Moral y Villalustre (2009a)."

Thus, besides being experts in their respective academic disciplines, 2.0 lecturers have to be equipped with the necessary professional competencies (cognitive, teaching, technology, communicative, emotional, etc.) to successfully rise to the challenge of their duties in the 2.0 era.

Likewise, the progressive and greater planning of teaching in competency terms has led to a significant change in the education practices of teaching staff, which require specific professional training to help and accompany students throughout their education processes.

From this perspective, we believe that is necessary to know which competencies teaching staff employ in their day-to-day practice and, ultimately, to ascertain their professional competency levels as a way of identifying strengths and weaknesses in order to contribute to the enhancement of teaching practice.

Professional Competencies Of 2.0 Lecturers

Context

In the second semester of the 2009/2010 academic year, 70 university lecturers teaching one of several subjects in e-learning mode on the *Campus Virtual Compartido del G9*[1] were asked to complete a questionnaire (2010); 840 students that had taken any of those subjects were asked to complete a similar questionnaire. The information requested referred to the methodological and teaching aspects of the e-learning subjects in order to infer – from the data obtained – an assessment of the lecturers' professional competencies in education practices as applied to virtual environments. It should be noted that the students' and the lecturers' opinions were taken into account.

Participants

Surveyed university lecturers:

Briefly, in the sample of surveyed lecturers, 65% were male and 35% were female, from various knowledge areas. In both cases, most of them were aged 38-45 and had a mean of 2-5 years of virtual teaching experience.

Surveyed university students:

In the sample of surveyed university students, just over 45% were female and 55% were male, from various degree courses. In terms of age, most of them fell within the 20-24 age range. The highest percentage of students was from the University of Oviedo (25%), followed by the University of

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1. Comprising the universities of Cantabria, La Rioja, Extremadura, Oviedo, the Balearic Islands, the Basque Country, Zaragoza and Castilla-La Mancha, and the Public University of Navarre.

Extremadura (22%), the Public University of Navarre (15%) and the universities of Cantabria (11%), Castilla La Mancha (10%), the Basque Country (8%), La Rioja (6%) and the Balearic Islands (3%).

Data gathering instruments

Two similar questionnaires were used. Through the questionnaire for lecturers, data were gathered on the methodological aspects that they said they adopted to teach their respective subjects. Through the questionnaire for students, data were gathered on their perceptions of the lecturers' performance in the various e-learning subjects, particularly in relation to: 1) Aspects referring the lecturers' *technology competencies*; 2) Aspects referring to the lecturers' *teaching competencies;* 3) Aspects referring to the lecturers' *tutoring competencies*.

Presentation of results

1) The lecturers' technology competencies

On the basis of several items, the lecturers were asked to assess certain aspects that served as indicators to identify their technology competencies, such as the level of skill and ability that they believed they had with regard to handling the tools of the virtual environment in which the various subjects were taught; the tools for designing teaching materials; and their level of skill with regard to office-automation and web-browsing programs.

Table 1. Percentage distribution of the level of skill and ability of use that the lecturers said they had with regard to the handling of various tools

Level of skill	SKILL AND ABILITY IN THE USE OF TOOLS:		
	Of the virtual environment	For designing teaching materials	Office automation and web browsing
Very low	-	-	-
Low	-	3%	-
Medium	5%	23%	-
High	55%	41%	42%
Very high	40%	33%	58%

Just over half of the lecturers (55%) said that they had a *high* level of skill in the use of the tools of the virtual environment in which they taught, while 40% said that they had a *very high* level of skill. However, when asked about their level of skill with regard to handling tools for designing teaching materials (presentations multimedia, web pages, etc.), 3% considered that their level was *low* and 23% *medium*. This is a handicap that needs to be overcome because, to teach a subject in a virtual environment, it is an essential requirement that lecturers elaborate motivating, attractive materials that facilitate the study of and approach to the content dealt with in each subject.

With regard to the level of skill and ability in the use of office-automation programs (Word, PowerPoint, Excel, etc.) and web-browsing programs, 58% of the lecturers stated that they had a *very high* level, while 42% stated that they had a *high* level. This undoubtedly gives an idea of the lecturers' predisposition to access various technological tools.

2) The lecturers' teaching competencies

Through several items, which served as indicators, the lecturers and the students were asked to assess various aspects directly related to: a) the lecturers' ability to adopt, in their subject, a suitable *instructional design*; and b) their capacity and skill to *design teaching materials*. The results are presented below:

a) Teaching competencies connected with instructional design

Through the first set of items, data were indirectly gathered on the personal assessments that the lecturers made of their level of teaching competency. Data were also gathered on the same issue through the assessments that the students made. For that purpose, the lecturers and the students were asked about the suitability of the presentation of the objectives that guided the subject taught or taken, respectively. Thus, it was found that while 83% of the lecturers stated that they had always given their students a clear, explicit presentation of the objectives (Table 2), only 60% of the university students were of the same opinion. In addition, it should be underscored that 19% of the students surveyed pointed out that they had not perceived that the lecturers had presented the objectives with the desired clarity and transparency.

Something similar occurred with the assessments that the students made of the existence of a clear definition of the competencies that they were supposed to attain from the subject taken online, since 18% of them stated that they had *never* or *hardly ever* been made known to them.

Table 2. Percentage distribution the lecturers' (LEC) and the students' (STU) assessments of teaching competencies connected with instructional design

Items	Never/Hardly ever		A Sometimes		Always/Nearly always	
	LEC	STU	LEC	STU	LEC	STU
1. Gives a clear, explicit presentation of the learning objectives	1%	**19%**	16%	20.5%	**83%**	**60.5%**
2. Defines and makes known the competencies that students should attain and/or develop	6.7%	**18%**	41.7%	26.5%	51.6%	55.5%
3. Offers suitable content to attain the objectives of the subject	1.6%	18%	11.3%	18.6%	**87%**	63.4%
4. Proposes activities that allow content to be assimilated and to achieve good learning	-	15.6%	11.5%	**20%**	**88.5%**	64.4%

Table 2. Percentage distribution the lecturers' (LEC) and the students' (STU) assessments of teaching competencies connected with instructional design

Items	Never/Hardly ever		A Sometimes		Always/Nearly always	
	LEC	**STU**	**LEC**	**STU**	**LEC**	**STU**
5. Sets ongoing assessment or self-assessment tests or exercises	6.4%	11.3%	6.5%	14%	**87%**	74.8%
6. The assessment formula adopted allows the assimilation of content and the attainment of objectives to be demonstrated	-	**15.2%**	11.5%	18%	**88.5%**	66.8%
7. Fosters collaborative work among students through activities	38.3%	32%	20%	21.7%	**21.7%**	**46.3%**

Most of the lecturers surveyed considered that they had offered suitable content to attain the objectives (87%) and proposed activities that allowed such content to be assimilated (88.5%) (Table 2). However, the students' opinions in this respect were very divided: 15.6% stated that the lecturers had *never or hardly ever* proposed any activities that allowed them to assimilate content and achieve good learning, while 20% pointed out that the lecturers had only *sometimes* done so (Table 2).

These data are worthy of serious reflection because, according to Cabero and Román (2006), if educational activities help students to approach the content dealt with in the subject while developing cognitive operations of various kinds, then there is no doubt that great pains should be taken to ensure the proper formulation of suitable activities that are relevant to each learning situation, because such formulation is one of the fundamental tasks of the teaching function that demonstrates teaching competency.

Likewise, the establishment of an assessment system that is consistent with the objectives and content of the subjects is something that needs to be thoroughly planned and not left to chance. Nor should arbitrary or simplistic formulas be adopted (Del Moral & Villalustre, 2009b). On this issue, it should be pointed out that over 88.5% of the lecturers considered that the mode of assessment they had adopted was suitable for ascertaining the attainment of the objectives and the students' level of assimilation of content, while the remaining 11.5% stated that this was *sometimes* the case (Table 2).

In contrast, just over 15% of the students (Table 2) perceived that the planned assessment system was not suitable for measuring their advances and progress on the subject. This therefore brings into question the relevance and suitability of the assessment criteria and formulas that are often adopted in virtual and blended-learning contexts.

According to Miller (2000), collaborative learning arises as a response to the subject's need to learn alongside others. And there is no doubt that fostering situations that encourage such learning does indeed contribute to a mutual enrichment and a transfer of knowledge. However, 38% of the lecturers surveyed (Table 2) stated that they had *never or hardly ever* proposed or undertaken any activities aimed at fostering collaborative learning among their students, while 20% had *sometimes* done so and only 22% had *always or nearly always* done so.

Consequently, we found an association with the data gathered from the students because 46% of them (Table 2) stated that their lecturers had regularly fostered collaborative learning, while only 22% had *sometimes* done so and 32% had *never or hardly ever* done so.

b) Teaching competencies connected with the design of materials

Another set of items was aimed at finding out about the teaching competencies that the lecturers stated they had with regard to designing teaching materials, and about the students' assessments of them. For that purpose, they were first of all asked about aspects connected with the structure and design of teaching materials. And, in this respect, over 88% of the lecturers (Table 3) considered that the materials elaborated on digital media were suitable for facilitating study and had a suitable structure. The students' opinions in this respect were very disparate: 16% and 19% of them pointed out that the presentation and the structure of the teaching materials, respectively, were not suitable.

Table 3. Percentage distribution the lecturers' (LEC) and the students' (STU) assessments of teaching competencies connected with the design of teaching materials

Items	Never/Hardly ever		Sometimes		Always/Nearly always	
	LEC	STU	LEC	STU	LEC	STU
8. Includes teaching materials that facilitate study	3.3%	**16%**	8.2%	20.5%	**88.5%**	63.5%
9. The teaching materials for the subject have a suitable structure	5%	**19%**	6.5%	19%	**88.5%**	62%
10. Considers that the times chosen for the presentation of the teaching materials were appropriate	-	17%	16%	23%	**84%**	**60%**
11. Facilitated the students' access to the teaching materials and activities	-	12%	3%	18%	**97%**	**70%**

Likewise, a large majority of the lecturers considered that the times chosen for the presentation of the teaching materials and for access to them were suitable (84% and 97%, respectively) (Table 3). However, the students' perceptions of these aspects were considerably lower (60% and 70%, respectively). Worthy of note are the percentages of students who judged their lecturers harshly for not facilitating the teaching materials at the time and in the manner that they would have liked (17% and 12%).

3) The lecturers' tutoring competencies

This set of items contained indicators that served to find out about the level of the lecturers' tutoring competencies. It was possible to infer this aspect from the answers that the lecturers and the students gave on various matters connected with the guidance or with the tutoring offered by their lecturers, as well as the stated abilities to manage participation. The results were as follows:

a) Tutoring competencies connected with tutorial guidance

In an attempt to assess the level of the lecturers' tutoring competencies, the lecturers and the students were asked about matters connected with the guidance and tutorial actions offered by the lecturers and received by the students in the course of educational actions.

Among other things, the aim was to establish whether strategies had been put in place to deal with the students' cognitive diversity, since such strategies greatly help to ensure optimum results in the learning process, as highlighted in the research projects undertaken by Del Moral and Villalustre (2004). The data show that 57% of the lecturers (Table 4) stated that they had made efforts to adapt to the prior knowledge that the students had, as well as to the cognitive particularities of their learning styles. Similarly, 41% of the students confirmed that this was the case, though it is significant that 28% of them pointed out that they had *never or hardly ever* perceived that the lecturers had made any effort to adapt to the students' knowledge and personal styles.

Table 4. Percentage distribution the lecturers' (LEC) and the students' (STU) assessments of tutoring competencies connected with guidance

Items	Never/Hardly ever		Sometimes		Always/Nearly always	
	LEC	**STU**	**LEC**	**STU**	**LEC**	**STU**
12. Makes an effort to adapt to the students' prior knowledge and learning styles	10%	28%	33%	31%	**57%**	**41%**
13. Regularly sends messages to guide and orientate the students' learning	5%	**30%**	22%	24%	**73%**	46%
14. Quickly and clearly answers the students' queries on activities	-	21%	2%	19%	98%	60%
15. Provides specific results and comments to support the students' learning progress	3%	**28%**	17%	19%	**80%**	53%

According to Mingorance (2001), another good practice that helps to explain a lecturer's tutoring competency is the promotion of self-regulated and collaborative learning through various methodological and communicative strategies both inside and outside virtual contexts. A tutorial action centred on guiding and orientating students becomes the backbone of the educational action. In this respect, 73% of the lecturers (Table 4) considered that they had regularly sent messages to motivate and guide the students' learning, though this statement was not shared by 30% of the students, who seemed to feel a little unaccompanied.

Likewise, while 80% of the lecturers (Table 4) considered that they had provided the students with specific results and comments to foster the students' learning progress, 28% of the students (Table 4) were critical of the fact that they had not received personalised comments of support and encouragement in relation to their progress, and indirectly demanded that their tutors provide them with that motivation.

Nevertheless, as García and Troyano (2009) point out, we should not lose sight of the fact that tutorial action is conceived as a student support system that allows students to receive personalised accompaniment in order to ensure successful learning.

b) Tutoring competencies connected with participation management

Given that these subjects are taught in a virtual environment, the participation mechanisms that the lecturers mediate become very relevant because the students' continuance on a subject will greatly depend on them.

Thus, the lecturers and the students were asked about the existence of tasks to facilitate the introduction of the participants in the educational action in the first few days. Just over 70% of the lecturers (Table 5) stated that they had *always/nearly always* undertaken these tasks. However, over 28% of the students (Table 5) did not share that statement. It is essential to foster initial contacts between all the participants so that they can get to know each other and establish links that encourage interaction and favour the subsequent realisation of joint educational activities.

Table 5. Percentage distribution the lecturers' (LEC) and the students' (STU) assessments of tutoring competencies connected with participation management

Items	Never/Hardly ever		Sometimes		Always/Nearly always	
	LEC	STU	LEC	STU	DO	LEC
16. Proposes tasks to facilitate the introduction of all participants in the first few days	18.3%	**28.3%**	10%	25%	**71.7%**	46.7%
17. Quickly and effectively deals with problematic situations	-	**22.3%**	15%	26%	85%	51.7%
18. Fosters participation and communication among the subject's students	15%	**23.4%**	20%	24%	65%	52.6%
19. Guides participation in forums/wikis and encourages the compilation of conclusions	**23.3%**	14.6%	30%	26%	46.7%	59.4%
20. Asks the students to give arguments and reasons for their statements, suggestions, etc.	8.4%	17%	16.7%	**24%**	**74.9%**	59%
21. Redirects the contributions towards the original activity or topic, if they have gone off track	6.7%	20.8%	25%	28.6%	68.3%	50.6%

Likewise, just over 22% of the students (Table 5) perceived that the feedback given by the lecturers had not been as fluid as they would have liked, while 23.4% considered that the lecturers had not fostered participation and communication among all fellow students. These factors are considered to be of vital importance because the students' continuance in the subject's virtual environment often depends on them to a large extent.

Furthermore, 74% of the lecturers (Table 5) stated that they had asked the students to give arguments and reasons for their statements and suggestions. However, 24% of the students considered

that the lecturers had only *sometimes* asked them to undertake this task. This is an essential prerequisite for ensuring optimum learning that is not subject to relativism, but to thoroughness and grounding.

Finally, it should be noted that just over 23% of the lecturers (Table 5) stated that they had not regularly guided the students' participation through forums or wikis that had been set up on the various institutional LMSs of the universities. This finding is easy to understand if the volume of students is high, since it increases the amount of time that lecturers need to spend on monitoring collaborative practices through such tools.

Conclusions

In order for ICTs to contribute to achieving the quality, mobility, diversity and competitiveness that the new EHEA wishes to foster for all education agents involved in the university education progress, they must become a substantial part of those agents' teacher training and preparation (De Pablos, 2005). In this regard, university education practices applied in virtual learning environments represent a major challenge. It is necessary to underscore the fact that they are spaces that can help lecturers generate and take actions that foster students' learning through the adoption of new forms of communication, tutoring and interaction (Area & Adell, 2010).

The study carried out highlights the fact that just over 80% of the lecturers considered that good teaching planning had been undertaken. However, the percentage fell to around 60% when the students were asked about the same issue. Likewise, around 75% of the lecturers made a positive assessment of their capacity to carry out tutorial actions, an assessment that is shared by approximately 50% of the students. Similar data were obtained for the surveyed lecturers and students with regard to the lecturers' capacity to manage participation; 70% of the lecturers and 53% of the students made a positive assessment of this issue.

Thus, from the results obtained, it was possible to identify a whole series of strengths and weaknesses in relation to the professional competencies that the lecturers had in order to undertake their activities in virtual contexts.

Among the *strengths* found in relation to the *teaching and technology competencies* that the lecturers employed, according to the lecturers' and the students' opinions, the following stand out: the proper formulation of activities that foster learning, the consistency of objectives/content with the assessment made, the setting of self-assessment tests, etc. Likewise, for the most part, the surveyed lecturers and students highlighted the fact that they had perceived clarity in the presentation of content, the variety of resources used, the potential for content interaction, etc.

The main *weaknesses* were the lack of effective proposals for practicals that promote collaborative learning through participation and interaction among all students to foster a suitable context that encourages the shared construction of knowledge, as well as the lack of a suitable structure of teaching materials that facilitates the students' journey through the content and their understanding of the interrelation and connection that may exist between the various sections such materials comprise.

With regard to the *strengths* stated by the surveyed lecturers and students in relation to the tutoring

competencies that the lecturers perceived they had, worth underlining is the existence of individual and group tutoring practices fostered by fluid communication through clear, quick answers to the students' queries. However, the lack of personalised comments of support and encouragement in relation to the students' learning progress was the main *weakness* found by the students.

Finally, from the results obtained, it was possible to establish the competencies considered essential for 2.0 lecturers to have:

Teaching and technology competencies

- The capacity to motivate, through the design of content focusing on practical application and the formulation of activities adapted to the students' cognitive characteristics and interests.
- The capacity to assess learning, adopting continuous assessment that checks the assimilation and practical application of content.
- The capacity to handle digital tools suited to the content and to the activities that need to be undertaken, and to the students' cognitive characteristics.
- The ability to suitably select and use 2.0 resources to promote learning.

Tutoring competencies

- The capacity to communicate, as well as social skills and empathy, to foster the process of communication and interaction with and among students in the virtual context.
- The ability to create and manage work groups and to promote the students' active participation by previously selecting the right 2.0 tools to make that effective (blogs, wikis, etc.).

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About the Authors

Dr Mª Esther del Moral Pérez
emoral@uniovi.es
Professor of New Technologies Applied to Education, University of Oviedo

Coordinator of the Tecn@: Technology and Learning research group. Member of the University of Oviedo's Innovation Committee through merit-based selection. Lecturer of the pioneering virtual subject Education in the rural environment, taught online on the *Campus Virtual Compartido del G9*. She has published various books, including: *Televisión, desarrollo de la creatividad e infancia* (coord.) (2010), Barcelona: Octaedro; co-author of the book *Proyecto MATRIX*: *Modalidades de aprendizaje telemático y resultados interuniversitarios extrapolables al* Blended Learning (2009), Barcelona: Octaedro; coordinator of *Experiencias docentes y TIC* (2008), Barcelona: Octaedro; *Sociedad del conocimiento: ocio y cultura* (2004), Oviedo: KRK; and author of *Reflexiones sobre NNTT y educación* (1998) at the University of Oviedo. She has written various book chapters in collaboration with other authors and numerous articles for Spanish and international journals, as well as a host of papers for national and international conferences, which can be found on DIALNET.

Dr Lourdes Villalustre Martínez

villalustrelourdes@uniovi.es

Lecturer in New Technologies Applied to Education, Department of Education Sciences, University of Oviedo

Lecturer on various virtual teaching courses aimed at university teaching staff and imparted on the Virtual Campus of the University of San Martín de Porres, Peru. Member of the Tecn@: Technology and Learning research group. Her research focuses on the study of virtual learning environments and cognitive styles, as well as the design of hypermedia educational applications. She has participated in various competitive research projects funded by the Spanish Ministry of Education and Science and the University of Oviedo, among others. She is the co-author of the book *Proyecto MATRIX: Modalidades de aprendizaje telemático y resultados interuniversitarios extrapolables al* Blended Learning (2009), Barcelona: Octaedro. She has written various book chapters in collaboration with other authors and numerous articles for major Spanish and international journals, indexed in the most important databases. She has made numerous contributions to national and international events and conferences.

Universidad de Oviedo

Facultad de Formación del Profesorado y Educación

Despacho 210

C/ Aniceto Sela, s/n

33005 Oviedo (Asturias)

Spain