E- Learning of Andalusian University's Lecturers. Gender

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ABSTRACT
This study forms part of the research project: "*Use of eLearning in Andalusian Universities: current status and analysis of good practice*". Our research focuses on two fundamental areas: firstly, the Virtual Andalusian Campus (VAC) as defined in the Digital University project set up by the Andalusia's Regional Administration, and secondly an assessment of the technical and didactic potential of Learning Management Systems (LMS) for the teaching staff at these universities. The research was ndertaken using a quantitative methodology hich collected and analysed data through questionnaires to find out how eLearning is used by 1302 lecturers of different level of six different Andalusian´s university, and to assess their levels of satisfaction with it. The university teaching staff demonstrated positive attitudes towards the e-learning and b-learning process, the methods used, the support offered by the university, and the development programme. The research demonstrates the success of the programme, and shows that it promotes diversity within the university by making use of a variety of personal and professional factors. It also confirms that the majority of teaching staff at the universities do not consider the use of different platforms to be a problem, and that the success of the experience is dependent on the support and attitudes of the university. We found significant differences between the lecturers in terms of gender in two areas: male lecturers had more knowledge of the tools, and female lecturers made more use of them.

Keywords: Higher education, faculty training, e-learning, learning management system, use ITC, gender.

INTRODUCTION
There is no doubt that e-learning has become one of the central points of university education in recent years. To a certain extent, we could say that it has been "institutionalized" in all universities (Aguaded & Diaz, 2010). For its strengthening, the European Union launched two initiatives: the "eLearning Action Plan" and the "eLearning Program." The objectives of these initiatives are aimed at providing infrastructure to institutions and the development of training for teachers (Uzumboylu, 2006).

Some of the results of these initiatives are presented in the *1st European e-learning Measurement* developed by Cross knowledge, Fefaur & Ipsos (2011), where e-learning strategies used in six European countries (France, UK, Spain, Italy, Belgium and The Netherlands) are ranked as training tools. The most important conclusions that derive from this document are: 1st) An European pattern in e-learning utilization can be stated as a fact. Furthermore, a common system of presenting and applying e-learning courses is shared by them all, regardless of maturity and specific cultural standards; 2nd) On behalf of e-learning growth, it can be argued that this training tool is involved in a widening process. The survey shows that the greater the e-learning use, the higher its future development perspectives, especially with an increase of smart devices; and 3rd) It should be highlighted that blended learning is the most requested format, together with this growing tendency in e-learning use.

Is why To a certain extent, we can say that network-based training has become a more and more popular form of teaching in higher education, thanks to the ongoing advances of the internet.

However, much of the research has been conducted in order to study the technical factors and the type of platform used instead of learning models for use.

A systematic search of the research literature from 1996 through July 2008 identified more than a thousand empirical studies of online learning (Means, Toyama & Murphy, 2009). Analysts screened these studies to find those that (a) contrasted an online to a face-to-face condition, (b) measured student learning outcomes, (c) used a rigorous research design, and (d) provided adequate information to calculate an effect size. As a result of this screening, 50 independent effects were identified that could be subjected to meta-analysis. The meta-analysis found that, on average, students in online learning conditions performed modestly better than those receiving face-to-face instruction. The difference between student outcomes for online and face-to-face classes was larger in those studies contrasting conditions that blended elements of online and face-to-face instruction with conditions taught entirely face-to-face. Analysts noted that these blended conditions often included additional learning time and instructional elements not received by students in control conditions. This finding suggests that the positive effects associated with blended learning should not be attributed to the media, per se.

Tweddell (2007)'s research on e-learning shows that technical disadvantages are easier to overcome than the lack of communicative skills. Communication errors tend to create serious problems that technology cannot solve. These obstacles deal with problems related to the unsatisfactory role performed by teachers as trouble-shooters, fostering facilitators and communicators in digital environments.

In this sense the European Commission's Directorate-General for Education and Culture (PLS Ramboll, 2004) has drawn attention to the fact that research should take a more pedagogic and didactic direction and move on from the basic technological arguments.

Hence and recently, a number of researchers have conducted investigations on the use made by teachers and students of e-learning. (Pullen & Snow, 2007; Duart et al, 2008; Lu & Chion, 2009; Means et al, 2009; Ginns & Ellis, 2009; Cabero, 2010; Osorio, 2010; Muñoz & González, 2010). These investigations have obtained a number of conclusions such as the fact that both teachers and students are very satisfied with virtual learning systems, performance levels are positive, there is a preference for a hybrid model that combines the virtual personal assistance with study and that teachers makes a limited use of the potential that the Learning Management Systems offer.

E-LEARNING: LECTURERS AND STUDENT SATISFACTION

Many researches (Aguaded & Díaz, 2010; Cabero, 2010; Ellis & Goodyear, 2010; Ginns & Ellis, 2009) show a students' positive attitude and self-efficiency towards e-learning. Peng et al (2006) point out that the students are bound to consider e-learning as a useful tool – a useful technology. They say there are differences in university students' attitude and perception towards it depending on their sex; male students tend to have more positive views than female ones. Moreover, they argue that students who perceive e-learning as a leisure activity tool show better and more independent communicative skills than others who only use e-learning as a productivity technological implementation.

Conclusions related to the quality level perceived by students who took one or more e-learning courses are presented by Jung (2011); he identifies certain aspects to assess such as: Interaction, Assistance, Institutional Quality Assurance, Credibility, Information and Publicizing, Learning Tasks, etc. Finding out that some such as, for example, technology assistance, contents and rating did not seem to be important for the students. Some variables like the students' cultural level, their characteristics or the e-learning course design could be considered responsible for this.

According to Ellis & Goodyear (2010), it could be said that some of the most adequate e-learning strategies for a good acquisition in this kind of environment might be: a) learning through discussion (sharing a learning community); b) research work learning (it offers resources to develop research activities). They come to the conclusion that students usually feel rather satisfied with their e-learning performance.

In relation to lecturers, the work of Bollinger & Wasilik (2009) gives us a more specific account of the factors which contribute to **lecturers' satisfaction** with the incorporation of e-learning. These are detailed as follows: a) *Factors relating to the student*, it provides access to education for a more diverse student population; opportunities for students to take part in highly interactive communication with lecturers and with fellow-students, etc…; b) *Factors related to teachers*, can encourage positive results in students, poses an intellectual challenge and promotes interest in the use of technology, research and collaboration with colleagues, etc…; c) *Factors related to the institution*, lecturers' satisfaction is generally high when the teaching institution has policies regarding online education which support the college. The main barrier to lecturers adopting online

learning is that they overestimate the work involved, because they think the workload will be greater than for traditional courses.

At the same time, it is worth noting that a number of studies show that one of the main problems we face in incorporating e-learning is in **training and enabling teaching staff** (Blázquez & Alonso, 2009; Cabero, 2010; Romero, 2011), and that this training should be broader than mere technological components and should aim towards a more didactic approach. A number of studies demonstrate that technical obstacles are much easier to overcome than lecturers' lack of communication skills in these environments (Tweddel, 2007).

Bawane & Spector (2009) assert that the teachers performing online must assume a multidimensional role and are urged to integrate a range of different and numerous competencies. They also underline the fact that the teaching competencies required derive from the context in which the teaching is performed: the characteristics of the training program, the specific role of the teacher, and the financial, functional, and human resources available (e.g., the equipment of administrative staff, designers, technicians, etc.). Some researchers, such as Kreber & Kanuka (2006; quoted by Baran, Correia, & Thompson, 2010), indicate that virtual education environments promote the exploration of new teaching approaches, derived from enhancing collaborative work or practices which incorporate social learning.

In our context Muñoz, González & Hernández (2013) indicate the need for identify the roles and competencies of teachers performing in virtual environments is crucial to higher education institutions in order to build a common frame for teaching and training initiatives. One of the goals of their study is to identify and systematize teacher's roles. Results reveal that content drafting is the aspect in which the subjects declare the highest level of proficiency as opposed to assessment. Teachers also appear to be willing to improve their training, being aware of the changes and requirements entailed by e-learning.

Regarding gender aspects, Remmele & Holthaus (2013) research the co-construction of gender and technology, that is, the theory that the usage of and the attitude to certain kinds of technology are a way to "do" one's gender. Findings support the assumption that with the routinization of e-learning in higher education, e-learning loses its character as a technology. With the routinization of its usage, e-learning is becoming a gender-neutral tool with no outstanding technological appeal.

Finally, note results from Esterhuizen, Blignaut & Sellis (2013) on the perceptions of faculty members new to technology enhanced learning and the longitudinal observations of the e-learning manager during dedicated professional development in order to compile a socially transformative emergent learning technology integration framework for open and distance learning.

These and earlier findings underscore the importance of future studies to know the support of the institution faculty, the environment in which faculty have to address the realities of adopting; human factors relating to the adoption; concerns and reservations about the use; and continuing professional development needs, expectations, and motivators. Emphasizing that the sustainable integration of ICT into higher education institutions remains a major challenge for the adoption.

METHOD

The current research was undertaken as part of the Project to Investigate Excellence in Research Teams (Proyectos de Investigación de Excelencia en Equipos de Investigación) funded by the General Secretariat for Universities, Research and Technology (P07-SE-J02670). In this case, ten airn was to identify the ways in which teaching staff at universities in Andalusia use e-learning, and to evaluate these learning methods and their suitability for the European Higher Education Area.

The study gathered information on how our lecturers see the use of e-learning and b-learning in university education. To achieve this, we decided to send an online questionnaire to teaching staff who were undertaking e-learning and b-learning activities in a number of universities in Andalusia during the academic term 2013-14.

To compile the questionnaire, we followed the steps outlined below:

a) A review of questionnaires created for different projects to research lecturers' views on internet-based learning.
b) Creating the first version of the questionnaire.
c) Amendments to the questionnaire by the research team and experts.
d) Creating the second version of the questionnaire.

The definitive version was sent out in the first term of 2013 and consisted of 21 questions with a variety of typologies, including multiple choice, double-barrelled questions (yes/no); rating scales and open questions.

The questionnaire was sent out by internet and was sent to all teaching staff at the various universities. We decided to send it out online for the following reasons: to obtain information from a large number of people; low distribution costs; it could be filled in when the respondent wished; fast, simple coding; data protection and the ability to avoid coding errors.

The research sample was made up of 1.302 lecturers at the universities of Málaga (f=3, 0.2%), Cádiz (f-276, 21.2%), Huelva (=93, 7.2%), Jaén (f=45, 3.5%), Pablo de Olavide (f=195, 15.0%) and Sevilla (f=681, 52.4%). Percentages for male and female lecturers were fairly equal (f=696 – 53.6% male) and (f=603 – 46.4% female), with an age range of 31 to 50 years.

Figures 1. Location of the study Andalusia provinces within Europe.

To complete these details of the sample, we wish to point out two factors: the first is that the vast majority were teaching a subject using virtual methodology (f-546, 45.5%), gradually reducing in number: two (f=396, 33.0%) and three (f=258, 21%). Secondly, we were told that they had only recently become involved in the field of e-learning, in the previous academic term, in fact (f=540, 45.0%). We should also bear in mind, however, that a large number of teaching staff (f=483, 40.3%) had already spent between two and four years developing virtual learning activities with their students.

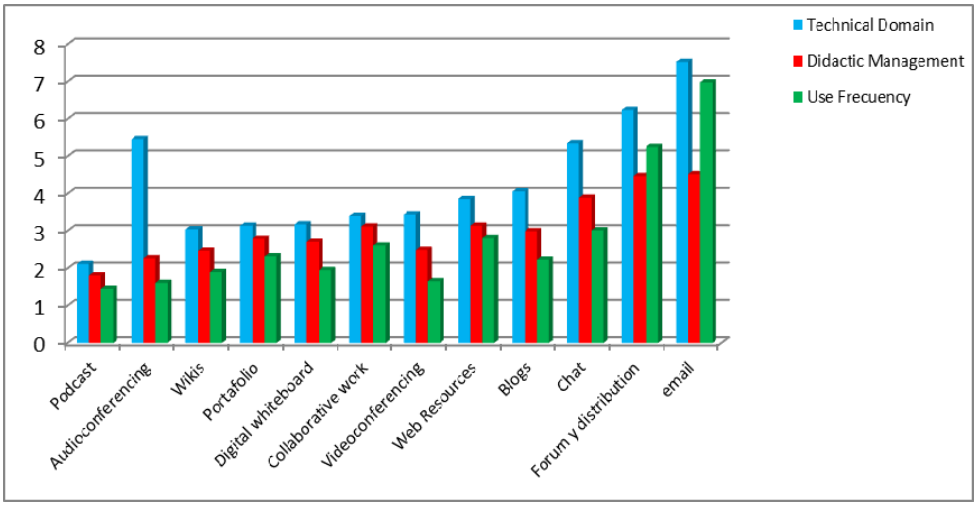
RESULTS

Regarding the extent to which they used the virtual platform provided by the university in their teaching, on a scale of 1 (very little) to 8 (a lot), the average was 5.10 with a standard deviation of 1.745. When asked about the extent to which they used the platform to its full technological potential, the average response was 4.69 with a standard deviation of 1.832.

As regards how often they used virtual learning, our findings were very similar for those who indicated that they used it “in all subjects” (f=606, 49%), and those who said they used it “according to the subject and the educational level of the students” (f=630, 51%). However, our teaching staff tended to combine sessions in lecture theatres with online training, and this applied to the vast majority of cases: (f=1182, 90.8%).

A large block of questions in the survey was aimed at finding out whether our lecturers considered themselves well prepared both technically and in terms of teaching, and how often they used the synchronous and asynchronous communication tools available to them in virtual learning. Once again, we gave them a scale of “1” (not at all) to “8” (very much). However, before approaching this, we made sure they were familiar with the tools we were going to ask them about. We found that the vast majority were familiar with the following: email (f=1,287, 99.5%), forums and distribution lists (f=1,239, 95.2%), chat rooms (f=1,222, 88.6%), blogs (f=894, 74.5%), digital whiteboard (f=732, 63%), collaborative work environments (f=678, 58.9%), category 2.0 web-based resources (f=771, 65.1%), videoconferencing (f=864, 72.7%), portfolios (f=609, 53.1%) and audioconferencing (f=648, 56.1%). We discovered that the area they were least familiar with was podcasts, where 72.4% told us they were unfamiliar with them.

As regards how competent they considered themselves to be in using technology as a resource and in using the various virtual learning tools available for educational use, (including how often they usethem), we were able to note the following factors from our findings. Firstly, there are a number of tools which the lecturers feel reasonably competent about using as technical instruments, such as email (7.53), forums and distribution lists (6.24), chat rooms (5.35) and blogs (4.06), in other words, synchronous or asynchronous communication tools. However, when we look at their ability to use them in teaching, and the frequency of use, only in two areas do they score higher than an average value of 4: email (4.52 and 6.98), and forums/distribution lists (4.47 and 5.25).



Figures 2. Frequency of Technical Domain, Didactic Management and total Use Frecuency.

It is striking how low the lecturers considered their competence to be in the educational use of some of the media, such as podcasts, audioconferencing, videoconferencing, digital whiteboards, portfolios and blogs. It also shows that the media they use most are email and forums/distribution lists.

Table 1.Means and standard deviations in the frequency with which teachers perform different with students in virtual learning.

	Means	Standard Dev.
Use a communication resource, such as forums, chat, email, ...	6,55	1,897
Develop some material in html, pdf, ... for the training of their students through the network.	6,73	1,873
Develop a hypertext format material or / and hypermedia to train their students through the network.	4,21	2,756
Develop audiovisual materials (audio clip or video clip) for the training of their students through the network.	3,01	2,412
Create blogs for their students	1,92	1,874
Create wikis for students	1,71	1,669
Create podcasts for their students	1,31	1,057
Develop webquest for students	1,89	1,889

We were also interested in finding out from the teaching staff about the activities involved in delivering network-based training. Out of the activities we asked them about, only three scored higher than the average of 4: “Have you ever used communication tools such as forums, chat rooms, email, etc?”, “Have you ever created material in html or pdf format, etc?” and “Have you created any material with hypertext or hypermedia for network-based teaching with your students?”

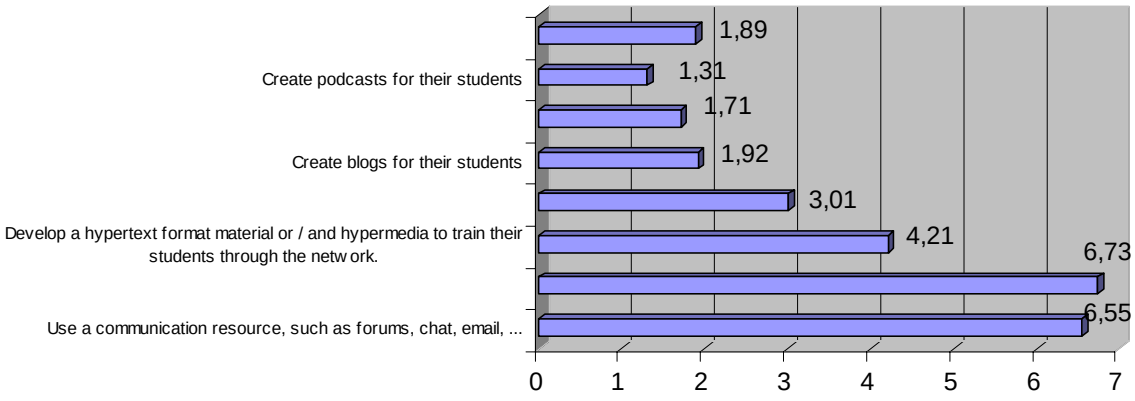


Figure 3. Activities with students in virtual training.

The following distribution emerged from the data gathered (highest scores first): **1)** Have you ever created material in html, pdf format, etc. for network-based teaching of students? (6.73); **2)** Have you ever used communication tools such as forums, chat rooms, email? (6.55); **3)** "Have you created any material with hypertext or hypermedia for network-based teaching of students?" (4.21); **4)** Have you ever created any audiovisual materials (audio or video clips) for network-based teaching of students? (3.01); **5)** Have you ever created blogs for your students? (1.92); **6)** Have you ever created Webquest activities for your students? (1.89); **7)** Have you ever created Wikis for your students? (1.71); **8)** Have you ever created podcasts for your students? (1.31)

The following table illustrates the lecturers' knowledge of virtual learning and their use of virtual learning activities.

Table 2. Knowledge of specific activities

		Frequency.	%.
Individualising teaching	Yes	873	70,3
	No	369	29,7
	Total	1242	100,0
Presenting or displaying materials	Yes	1209	96,2
	No	48	3,8
	Total	1257	100,0
Undertaking collaborative activities	Yes	726	59,2
	No	501	40,8
	Total	1227	100,0
Devising and setting problems: problem-solving methodology	Yes	855	68.8
	No	387	31.2
	Total	1,242	100.0
Working with project methodology	Yes	429	35.4
	No	783	64.6
	Total	1,212	100.0
Working with case study methodology	Yes	510	41.9
	No	708	58.1
	Total	1,218	100.0
Monitoring the completion and handing in of students' work	Yes	987	79.5
	No	255	20.5
	Total	1,242	100.0
Improving the arrangement and organisation of information, content and resources which are made available to students.	Yes	1,152	91.9
	No	102	8.1
	Total	1,254	100.0

Our findings show that the lecturers confirmed they were aware of the vast majority of these, but it is striking that a large number of lecturers said they were unfamiliar with two types of commonly-used network-based teaching, namely "Working with project methodology" (f=783, 64.6%) and "Working with case study methodology" (f=708, 58.1%).

With regard to the lecturers' reasons for using the activities we had asked them about, the average scores for the different options were as follows (highest scores first): "Presenting or displaying materials", (6.89); "Improving the arrangement and organisation of information, content and resources which are made available to students", (6.48); "Monitoring the completion and handing in of students' work", (5.55); "Devising and setting problems; problem-solving methodology", (4.60); "Undertaking collaborative activities", (4.15); "Working with case study methodology", (3.37) and "Working with project methodology", (3.15).

Table 3. Means and standard deviations of the use of virtual teaching activities.

	Means	Standard Dev.
Submit or display materials.	6,89	1,720
Engage in collaborative work.	4,15	2,642
Raise issues and propose. Problem solving methodology.	4,6	2,574
Working with the method of projects.	3,15	2,551
Working with the case study methodology.	3,37	2,554
Monitor the implementation and delivery of work by students.	5,55	2,548
Better manage and organize the information, content and resources that are made available to students.	6,48	1,984

We can also report that the vast majority of lecturers (76.1%) told us that they undertake no prior evaluation of their students' technical knowledge of the LMS provided by the university for virtual learning.

Those who answered *yes* tended to make use of the following activities: **a)** conducting a survey by questionnaire with the aim of collecting information on how much their students know about how the platform works (as we can see from the following), **b)** practical demonstration sessions in the first few days of the course and **c)** the aspects covered in these sessions are very varied, but they are generally focused and ensure the students know how the platform works. Some lecturers use the network's own synchronous and asynchronous communication tools to create learning activities.

With regard to whether or not they used the LMS to assess their students, responses once again tended towards the negative. More specifically, 69.3% said they did not. Those who replied that they did tended to use them in ways such as: "Creating tasks and dwell-time"; "Quantitative evaluation of tasks and problems."; "E-portfolios"; "Taking part in discussion and work forums"; "For testing"; "Marking assignments numerically; "Taking part in forums and work tasks"; "For exercises and distance work."; "Metacognitive strategies such as reflective diaries, portfolios, self-evaluation, self-regulation of learning through conceptual diagrams, self-observation and evaluation of the students' skills acquisition"; "Exams, questionnaires".

The brings us to point out different aspects: the diversity of strategies that are capable of using teachers, there is no orientation line network utilization as an assessment tool and to some extent seems to be some parallels in the translation to virtual contexts that have experience in the classroom.

When we asked the teaching staff if their university had given them access to any type of institutional help, most of them said that they had been given the following types of support: "Provision of equipment: computers, printers, etc." (Yes – f=873, 70.8%), "Advice on and/or training in the use of ICT in teaching" (Yes – f=1,005, 80.5%), and "Technical support if the machines break down or are not working" (Yes – f=840, 69.1%).

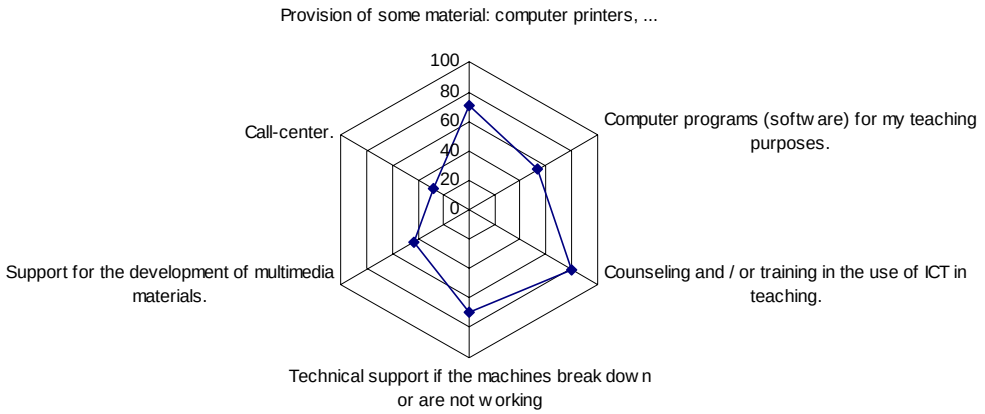


Figure 4. Institutional support received.

By contrast, most informed us that they were not made available a "call center" (No - f = 840, 72.4%), to resolve questions they might have. However, the results achieved in the response option "Support to resolve equipment failures or malfunctions," the stated above must be assumed with caution.

Regarding the ways in which the lecturers felt they had changed by using e-learning methodologies in their teaching, the vast majority of them indicated that there had been changes in terms of the different options open to them: “More regular changing and updating of the content of my teaching”; “Reflecting on the learning process my students use”; “Keeping up to date with new teaching methods” ; “Relations with students”; “Reflecting on my practice as a teaching professional” ; “Structure of the content delivered within the subject”; “Changing my role as a professional” and “Time management in a subject.” The lowest percentage was in “Most practical approach to a subject” where the proportion answering *yes* only reached 58.5% (f=714).

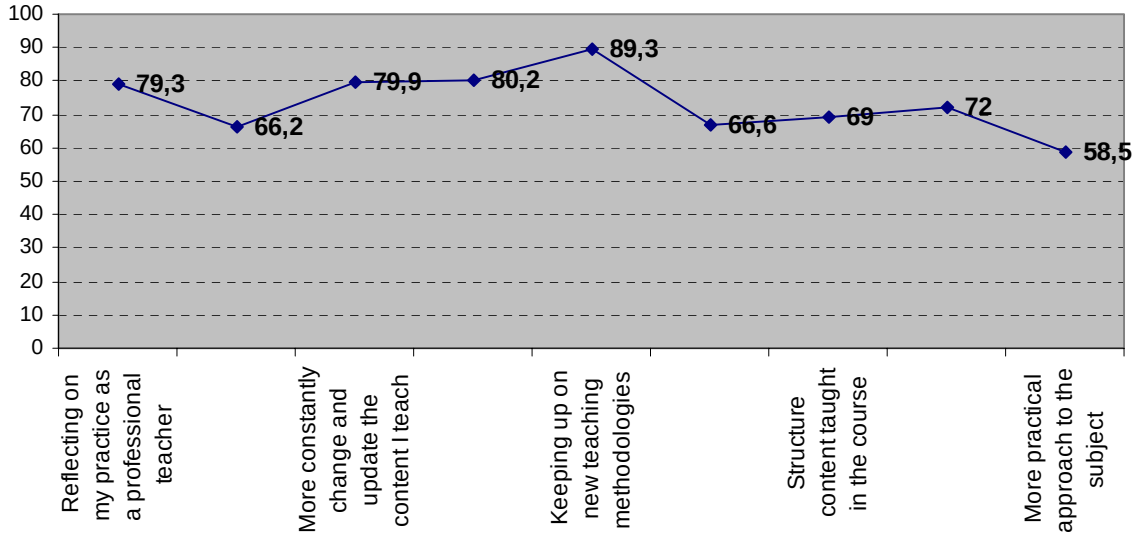


Figure 5. Areas where lecturers had changed their skills thanks to e-learning.

The last question in our survey was aimed at providing information on the types of training the lecturers had received for virtual teaching. The data show that they received two basic types of training: “Independent learning” (f=987), 38.51%) and “Training activities organised by the university” (f=933, 36.40%).

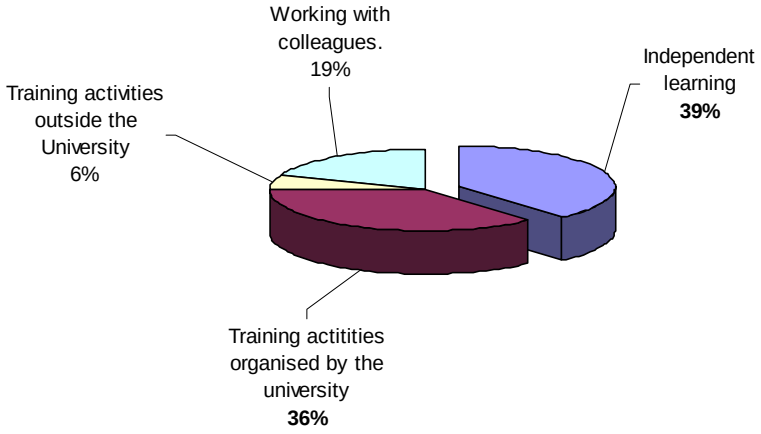


Figure 6. Where the training was acquired.

Having noted these comments, we shall now move on to test the hypothesis as to whether there were significant genders differences in the responses the lecturers gave. The hypothesis is as follows:

- H0 (null hypothesis): There are no significant gender differences between the lecturers with regard to the specific variables we analysed (alpha margin of error of 0.05).
- H1 (alternative hypothesis): There are significant gender differences between the lecturers with regard to the specific variables we analysed (alpha margin of error of 0.05).

The statistical test we shall use for this analysis will be the Mann-Whitney U test and the Chi-squared test, depending on the characteristics of the data we are comparing. This test is usual where two independent groups have been taken from the same population.

Firstly, we shall compare the extent to which the lecturers use the platform in delivering their teaching, and the extent to which they make full use of its technological potential. The values derived from the data allow us to reject the null hypothesis in both cases and consequently adopt the alternative hypothesis with an alpha margin of error of 0.05 and 0.01. In other words, we can say that "the extent to which the lecturers use the virtual learning platform provided by the university" (0.018) and "the extent to which they make full use of the technological potential of the virtual learning platform provided by the university (0.000) vary according to gender.

Table 4. Mann-Whitney - U for contrast gender of lecturers and the educational level of use of the platform and its technological possibilities.

	U de Mann-Whitney	Z	Nivel Sig.
The educational level using virtual training platform that offers the University	164322,000	-2,364	0,018
The extent to which the technological uses of virtual learning platform that offers the University	165901,500	-4,034	0,000

When the average range is analysed, we can see that female teaching staff achieve higher scores than their male colleagues or, in other words, that female lecturers indicate that they make greater use of the technical and learning capabilities of the virtual learning platform provided by the university than their male colleagues.

Table 5. Average ranges regarding the extent of the use of educational and technological possibilities.

	Gender	Average Range
The educational level using virtual training platform that offers the University	Woman	623,92
	Man	577,45
The extent to which the technological uses of virtual learning platform that offers the University	Woman	663,48
	Man	582,23

In analysing whether there were any significant differences in the lecturers' indications of their knowledge of the various technologies, the values derived from the data allow us to reject the null hypothesis in the following areas: blogs (0.000); wikis (0.000); podcasts (0.001); web-based resources 2.0 (0.30); videoconferencing (0.002); portfolios (0.022) and audioconferencing (0.001). We can therefore also say that there are significant gender differences within the teaching staff in terms of their knowledge of different communication tools. In all cases male lecturers scored higher than female lecturers.

Table 6. Chi-square test for knowledge of different ways depending on the gender of teachers.

	Chi-square	Nivel Sig.
Email	1,045	0,514
Forums and distribution lists	1,037	0,193
Chat	0,361	0,304
Blogs	17,493	0,000 (**)
Wikis	54,884	0,000 (**)
Podcast	10,913	0,001 (**)
Digital Whiteboards	0,717	0,216
Collaborative work environments	2,241	0,75
Recursos del contexto web 2.0	3,798	0,30 (*)
Videoconferencing	9,173	0,002 (**)
Portafolio	4,328	0,022 (*)
Audioconferencing	10,358	0,001 (**)

To find out if there are any significant gender differences between the teaching staff regarding their technological skills, their use of them in teaching and their use of different communication tools, we shall once apply the chi-square. The results allow us to reject H0 and adopt H1 with regard to technical skills, with an alpha margin of error of 0.05 or less, for the following communication tools: blogs, wikis, podcasts, category 2.0 web-based resources, videoconferencing, portfolios and audioconferencing. Once again, male lecturers scored higher than female lecturers. With regard to the use of this technology in teaching, H0 was rejected and H1 adopted for the following media: email, forums and distribution lists, chat rooms, blogs, wikis, podcasts and audioconferences. In both cases female lecturers had higher scores.

Regarding the use of technology, the results allow us to reject H0 and adopt H1 with an alpha margin of error of 0.05 or less for the following media and communication tools: email, forums and distribution lists, chat rooms, wikis, digital whiteboard, videoconferencing and audioconferencing. In this case, the results come out in favour of male lecturers for wikis, digital whiteboard, teleconferencing and audioconferencing. Female lecturers score higher for email, forums, distribution lists and chat rooms.

Regarding whether there were any significant gender differences within the teaching staff with regard to network-based teaching activities with students, the findings allow us to reject H0 and adopt H1, with an alpha margin of error of 0.05 or less for the following activities: "Creating material with hypertext and/or hypermedia for network-based teaching of students"; "Creating wikis for students" and "Creating podcasts for students".

Table 7. Mann-Whiteney-U for contrast gender of teachers and the performance of different types of activies. (*_Significant at alpha equals 0.05,**=significant at alpha equal to 0.01)

	U de Mann-Whitney	Z	Nivel Sig.
Use a communication resource, such as forums, chat, email,..	186682,500	-1,7880	0,074
Develop some material in html, pdf, ... for the training of their students through the network…	189481,500	-,8880	0,374
Creating material with hypertext and/or hypermedia for network-based teaching of students	164205,000	-3,774	0,000 (**)
Develop audiovisual materials (audio clip or video clip) for the training of their students through the network.	177327,000	-,896	0,370
Creating blogs for students	175990,500	-,164	0,869
Creating wikis for students	155929,500	-3,707	0,000 (**)
Creating podcasts for students	158350,500	-2,872	0,004 (*)
Creating webquest for students	165676,500	-1,316	0,188

In this case, we found that "Creating material with hypertext and/or hypermedia for network-based teaching of students" and "Creating wikis for students" were more common in male lecturers than female ones, while "Creating podcasts for their students" was used to a greater extent by female lecturers.

CONCLUSION AND DISCUSSION

Most of the lecturers deliver one or more subjects through virtual methodology, and most of them have only begun to use it recently, one or two academic years ago. This tends to be logical if we take into consideration that this type of learning has only really been promoted to any extent by the academic authorities in the last two years.

The lecturers tend to make fairly broad use of the Learning Management System provided by the university, but also recognise that they do not use it to its full potential. They tend to use virtual learning in combination with sessions in the lecture theatre, a system known as "blended learning". We believe this is due to two factors: they generally teach at universities where they are required to be present in person, and the preference for mixed models over totally virtual ones.

When it comes to the levels of knowledge the lecturers demonstrated with regard to specific synchronous and asynchronous communication tools that podcasts were the medium they were less familiar with. These data are very consistent with the findings of other studies by Duart et al. (2008), and Muñoz and González (2010).

However, if their knowledge can be considered adequate, the same is not true of their technical competence or their command of using the different synchronous and asynchronous communication tools and technical resources we suggested. The lecturers demonstrate a greater command, whether in terms of technology or use of the tools in teaching, of internet technologies that could be considered more traditional (email, forums, chat rooms, etc.). In the newer technologies, however, their training is fairly basic and inadequate. This is cause for concern in our view as it gives rise to a traditional model of e-learning known as category 1.0, which avoids all current developments in tools for interaction, collaboration and participation of students. It is therefore important to invest in training for lecturers which is more oriented towards the use of this technology in their teaching and not just training in how to use the LMS system, as we are learning more and more that the technical obstacles are easier to overcome than the ones involving didactic and communication skills (Tweddel, 2007).

With regard to the activities they used with their students, we found very little variance. In fact, the lecturers only tended to make broad use of two activities: "Creating material in html or pdf format for network-based teaching of their students," and "Using communication resources such as forums, chat room, email, etc." Also, they indicate that the resources they use are largely text-based, with very little use of visual, audio or audiovisual material.

The data we have received to date suggest that the lecturers tend to use technology-based distance learning environments more for information and for downloading or uploading materials than as an environment for a whole block of activities or collaborative work. At the same time, we could say that the activities carried out by the lecturers indicate that the e-learning model they are following is transmissive compared to a more participatory model or one where the students collaborate in the learning process, as the use blogs, wikis or treasure hunts would suggest.

It should be noted that very few lecturers do any preparatory work with their students to find out if they understand the LMS provided by the university. In any case, we should like to draw attention to the fact that training for students is a key factor: if they are not competent in using the system, it can introduce an element of anxiety and failure into a student's development, as noted by Tallent-Runnels et al. (2006).

It should also be noted that the vast majority of the lecturers indicated that they had received some form of help from their university in using virtual learning. The most common forms of help were as follows: "Provision of equipment: computer, printers, etc.", "Advice or training in the use of ICT in teaching" and "Technical support if the system breaks down or is not working."

For our lecturers, the fact that they had included virtual learning activities for their students had helped them bring about a series of methodological changes in the subjects they were teaching. In other words, we can say that using networks has not only helped our lecturers to incorporate a new methodology into their practice, it has also, and at the same time, redefined the things they were doing and helped them to make decisions in a series of directions.

The lecturers received a wide variety of training to help them take part in the experience. Common forms of training in new technology included “training activities organised by the university”, “independent learning” and working with colleagues.

Finally, we have found that there were gender differences between our lecturers in terms of the knowledge they told us they had of a series of communication tools used in virtual learning.

A striking finding from our study is that there are gender differences between the lecturers with regard to technical competence and ability in using different communication tools in teaching, and male lecturers scored higher than female lecturers. However this was not the case with how often they used the various synchronous and asynchronous communication tools. Here, female lecturers rated higher than male lecturers, just as they did in the general sense.

We can summarise by saying that we found significant differences between the lecturers in terms of gender in two areas: male lecturers had more knowledge of the tools, and female lecturers made more use of them. For this reason, we do not believe that gender should be used as a significant and exclusive variable when the university puts measures in place for organising training plans or specific activities. (Romero, 2011; Remmele & Holthaus, 2013)

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