

# Web 2.0 and Higher Education: Its educational use in the University Environment

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## Abstract

The aim of this study is for the teachers in higher education to provide relative information about the use of the web 2.0 resources within its context and within the framework of the university staff training program. In this context, we have developed a tool in order to study 400 teachers attitude, use and perceived usefulness of web 2.0 resources at the Spanish National University of Distance Education (UNED: largest distance university in Europe). Findings indicated that while some teachers feel that some web 2.0 applications can be effective at increasing satisfaction with a course, improving their learning and their writing ability, and increasing teachers interaction with students; few choose to use them in educational contexts. Additional results indicated that teachers use the 2.0 resources in accordance with the role of "content consumer" more than a "content creator".

**Key Words:** web 2.0, emerging technologies, higher education, teachers adoption, teachers role, decomposed theory of planned behaviour.

## Introduction

Without a doubt, the technologies derived from internet, such as e-mail, on-line courses, RSS readers, and LMS platforms, have added educational value to the traditional system of knowledge distribution in the classroom setting (Barnett, Keating, Harwook & Saam, 2004). That being said, for some authors (Santiago and Navaridas, 2011; Rittberger and Blee, 2009), the true educational potential for innovation and improvement of the communication and interaction processes in the classroom resides in the new applications of the so-called web 2.0. Its emergence has reinforced the convenience of a new teaching model focused on learning, which enables more independent, creative, participatory and cooperative educational processes[1].

Following the line of thought of other authors (Singly, 2003; Flichy, 2004; O'Reilly and Battelle, 2005; Alexander, 2006), we conceive web 2.0 as a set of tools, resources and channels conceived with the aim of enriching interactivity in the *online* communication processes, basically as refers to content creation and social participation (creating and sharing knowledge and experiences on internet). In light of this new social technology, higher education[2] must pay rapt attention to the advantages and possibilities that said technological applications offer in order to effectively respond to the emerging challenges and needs within Europe: among others, the need to establish an open area which enables permanent learning, presenting an optimum range of options and the possibility to easily access and exit the system, as well as new opportunities for individual achievements and active, democratic participation in order to facilitate real transformations in contemporary society.[3]

Following this line of analysis, it would be necessary to ask oneself: Why are the technological resources provided by web 2.0 so popular? Why does it apparently motivate people so much? What does it owe its current success to? The answer seems to lie in what it allows users to do. An average internet user[4] is capable, on one hand, of *accessing* information, *selecting it and organizing it* according to his/her tastes and preferences, and on the other, of *generating and posting* contents giving them social usefulness, significance and relevance. The available applications help even those users with limited ICT knowledge navigate through virtual space and find what they are really looking for, whether it be video, audio, text, image or animation, using different channels to do so (social and personal networks, content storage systems, collective knowledge, etc.) which means sharing virtual spaces (Madden & Fox, 2006; Maloney, 2007). These new resources make sharing documents and materials much easier than with other tools from just a few years earlier (Dearstyne, 2007).

In short, students not only access the web in order to obtain certain information, but they are also able to create collective knowledge through social interaction (Maloney, 2007). The 2.0 technologies permeate the

day-to-day life of young people today as well as that of the faculty, regardless of social level, and it is practically impossible to remain insulated from this phenomena. The aim of this study is for the teachers in higher education to provide relative information about the use of the web within its context and within the framework of the university staff training program.

Within this context, we are presenting this paper with the conviction that the teaching staff (from their perspective on teaching, to their didactic competence and their specific performance during the training process) is the key to introducing any kind of technological innovation or improvement in university didactics. He or she is the agent that transforms the entire theoretical model of teaching into a practical one, and both the design and the didactic strategy development depends on this agent for the promotion of quality learning. He/she must endow the technological tools with content and educational value and, ultimately he/she is also responsible for the integration of these resources in the different fields and areas of university knowledge. With this study approach it is essential to know which educational trends exist in connection with the use of web 2.0 resources in university activity. In order to do this, we take an approach based on the concept of New Alphabetisms, where "new" is justified from a sociocultural perspective as well as from an educational one (Lankshear and Knobel, 2008).

## Objectives

In accordance with the objective outlined in the previous section, in this investigation we will endeavour to establish the usage and didactic integration of the 2.0 resources within the framework of higher education based on feedback from the teaching staff itself. We will then proceed to identify the needs and opportunities upon which plans of action can be based in order to facilitate their integration into didactic activity.

More specifically, we propose to:

1. Identify the general profile of the university staff regarding the usage of the 2.0 tools, specifically in the case of the teachers-tutors of the UNED. (National University of Distance Education – Spain)
2. Describe differences in the use of 2.0 according to the personal characteristics of the teaching staff.
3. Identify the specific use made of the 2.0 resources in higher education in general within the context of flexible and distance education.
4. Analyze the role played by the teaching staff in the use of 2.0 resources: "content consumers" or "content creators".
5. Identify which 2.0 resources are used most by the faculty being researched, distinguish between "social networks", "content creation systems", "2.0 multimedia resources" and, finally, "information organization systems".
6. Determine what objectives the university teaching staff has regarding the aforementioned resources.

## Context of study

The UNED began the process of integration of ICT in the teaching-learning process in the year 2000, when the *Unidad de Virtualización Académica* (Academic Virtualization Unit) was inaugurated. The university has been immersed in a continuous process of administrative and functional changes, as well as changes in the approach to the *e-learning* process. Currently, two platforms are used at the UNED: WebCT and aLF (learn, collaborate, educate), an in-house development, although the former is on the verge of extinction. The second platform mentioned has been progressively integrated into the accredited studies at UNED. Through the use of this platform we have learning communities at our disposal (virtual spaces reserved for communication and participation in specific work groups) and online courses which progressively post the subjects which constitute the new Bachelor's Degrees presented in the aLF platform.

### FIT Venia Course

The course in which this study was introduced, is a pre-requisite for the subsequent "*venia docendi*" which provides the professor-advisers the option of carrying out their functions as educators of the UNED. The "*venia docendi*" for teaching specific subjects is granted by the head department in charge of each subject in question.

In this context training is required in order to perform the duties of professor-tutor. The following objectives are specified:

- Understand the conceptual basis of distance learning in the 21st century, stemming from the evolution of this educational system.
- Identify and comprehend the current organization and operation of the UNED, in the existing framework of the new EEES (European Space of Higher Education) degrees.

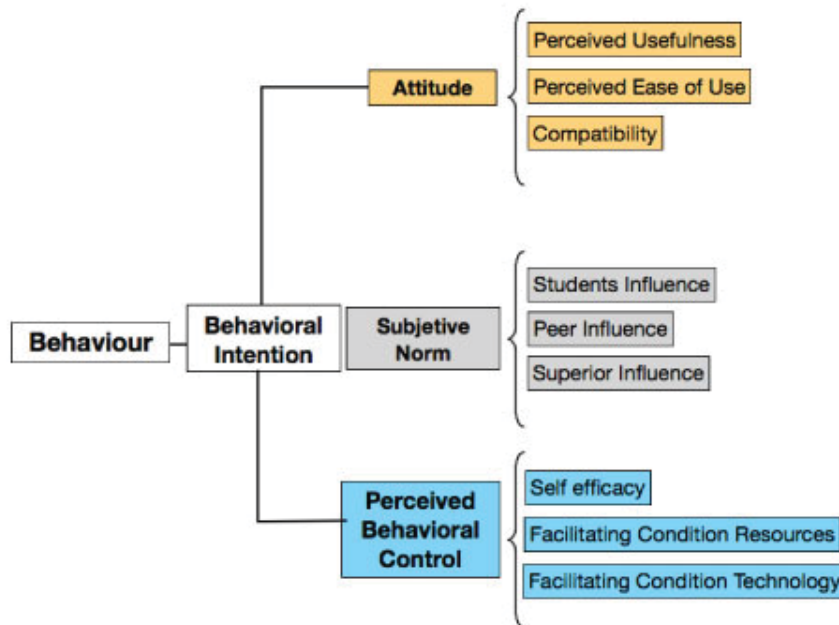
- Conduct an in-depth study of the duties carried out by the teaching staff according to the UNED model.
- Monitor the usage of the main didactic means and resources available to the supervising professors for their job through a supervised exercise regarding the planning and development of consulting functions in both presential and virtual modes.
- Promote conditions for sharing experiences and develop a useful collaborative effort for the supervising professors as a whole.
- Elaborate a database of experiences and best practices that can be shared.
- Determine the social, educational and cultural environment of the respective partner institution and its Campus.
- Establish networks within the campus itself.

As we can appreciate in this list, several of the objectives specified may somehow include the use of web 2.0 resources. Specifically regarding the development of the course, module III oversaw the use of web 2.0 for an entire week. It was during this time that the survey that serves as a basis for this investigation was introduced.

## Theoretical Framework

The basis of this investigative intervention is Ajzen's theory of planned behaviour (1991) as a conceptual framework for trying to understand the personal decisions of the professors/supervisors of the UNED in the adoption of web 2.0 as an additional resource in their teaching and advisory capacities. This theory basically sets forth that actions (in our case, decisions regarding the adoption of new technology), are determined by a combination of the behavioural intentions of the subjects and the perceived control of the behaviour. This model provides us with several clues as to the impact the integration of the ICTs has on the teachers.

Following is a possible graphic representation of this model:



*Figure 1. Factors involved in the adoption of web 2.0 in teaching. From Ajzen and Hartshorne (2008). It was adapted and translated to Spanish with the permission of the authors and of the editor (Elsevier) granted by Copyright Clearance Center*

Next, let's interpret a description of these factors, concentrating on those that are most relevant to our study:

- **Attitude:** In this context, attitude is defined as an individual's degree of acceptance of a specific situation. In the case of the introduction of web 2.0, we can highlight the following:
  - *Perceived Utility:* Will I work more efficiently by incorporating 2.0 technologies? Logically, if a positive perception of its utility prevails, then there will be a greater possibility of adoption.
  - *Perceived ease of use:* Is a great deal of effort needed to learn this technology? The less complicated it is, the more likely it is to be accepted by the educator.

- *Compatibility*: Do these technologies complement existing values or experiences of the centre? The more compatible they are, the more likely they are to be integrated by the educators as support in their teaching.
- *Subjective Norm*: Subjective norm refers to certain social pressures that cause an individual (in our case, an educator), to adopt a certain position in the course of carrying out his or her job (Taylor and Todd, 1995); in our study, the integration of web 2.0 as a teaching tool. Within the context of higher education, we make a distinction between certain social groups: “superiors”, “colleagues” and “students”. Whereas the first group may think that web 2.0 can improve the quality of learning of the students, the second group may feel pressured towards an “unwanted” change. In contrast, the students will probably be very receptive to the use of this technology, as their competency level and awareness of these areas is very high (Prensky, 2001; Lankshear and Knobel, 2008).
- *Perceived control of competence*. This factor comes into play in situations in which the individuals do not have complete control over their competence (authority) and can be broken down into two elements:
  - Self-efficacy in the use a particular technology (Bandura, 1982), which involves a feeling of “comfort” for the educator when deciding whether or not to adopt web 2.0, for example.
  - The facilitating conditions (Triandis, 1979), which have to do with the availability of resources (economic, temporary, formative...) when considering the possibility of using new technologies. In our case, this availability refers mainly to formative resources, both to learning them and to using them in the practice of their profession, to the extent that most of web 2.0 resources are free.

This study goes in depth on two other aspects related with the didactic use of the 2.0 milieu:

- Identifying if the professor-advisor from the UNED adopts the role of “*content consumer*” or rather, can be classed as a “*content creator*”, understanding the latter role as the most appropriate to an authentic pedagogical exploitation of the collaborative web resources. We will carry out this analysis in most of the applications.
- Identifying the aim of the pedagogical use of these resources. These perspectives change depending upon the resource being studied:
  - Obtaining information.
  - Motivating the students.
  - Maintaining the professional or personal information updated.
  - Encouraging collaborative work.
  - Assessing knowledge or competencies

This set of factors and analyzed perspectives can provide us with relevant information about the degree, method and aim involved in the integration of web 2.0 as an educational resource in the classroom.

## Method

The design of the study integrates quantitative and qualitative aspects and a survey on “web 2.0 in Higher Education” (W20EduSup) has been developed. Along the same lines as ratifying the content validity according to the UNED’s personal point of view, we also conducted *discussion groups* with a team of professors who carried out a content revision of the aforementioned survey. As a result of this discussion some of the original items were amended with the aim of including all of the possibilities and relevant variables in each of the case studies. Once the first draft of the survey was completed, the *opinion of experts* was sought out with the aim of verifying the validation process initiated. Each one of the expert judges was presented with the provisional draft of the W20EduSup tool along with a validation test which requested their expert opinion on the survey. The questions to be analyzed had to do with the following elements: clarity, formal aspects, language used, precision and length. The responses of the experts to most of the aspects analyzed were very positive. In fact, we’d like to point out that the overall evaluation of the 15 items resulted in a rating which fell between “excellent” and “very good”.

Table 1 outlines the aspects and variables used in the study, which are organized in relation to the 15 items which make up an online administrative survey for the faculty that took part in the FIT-Venia Docendi course at the UNED.

Table 1: Aspects and variables of the study

Aspects	Variables	Number of items
Personal characteristics of the teaching staff	Age, gender, years teaching, area of expertise	5
Teaching Internship for 2.0 resources: a) Social networks	a) Usage modality: distinguishing between “content consumers” and “content creators” b) Degree of utilization	8

b) Content creation systems and promotion of participation; c) Multimedia content creation systems d) Data organization system for distribution and updating	c) Purpose of usage: considered the essential element of the study in relating 2.0 resources with aspects of higher education.	
Findings/perceived needs	a) Regarding the educational potential of the 2.0 environment b) Training focus demanded for updating skills within this area: Degree of demand in a) technical b) didactic and c) organizational aspects	2

Specifically, and linking the instrument of data collection and Azjen's model of planned behaviour (1991), we will place particular emphasis on the "attitudinal" factors: "Perceived utility" and "compatibility" and in addition to this, "Perceived behavioural control: "Self-efficacy" and "Facilitating resources". We've omitted the part which makes reference to the "subjective norm", as we believe that for most of the educators their work at the UNED is only a partial endeavour and so it is difficult to objectively determine and measure the possible "social pressure" from their immediate supervisors (either at the partner institution or from the faculty heads), colleagues (at the same centre or other educators that participate in the course) and students (either presential or online).

## Results

### Sample population

A total of 402 educators have participated in the survey, which is 55.5 % of the total number of faculty (725) at the UNED that participated in the Venia Docendi course. With regards to the gender variable, 57 % of the male faculty and 43 % of the female faculty participated. The results according to age are reflected in the following pie chart in which we can see that the sections representing different age groups are distributed homogeneously in three parts: 36 to 45, 46 to 55 and 56 to 65. The group of faculty over 65 is practically insignificant.

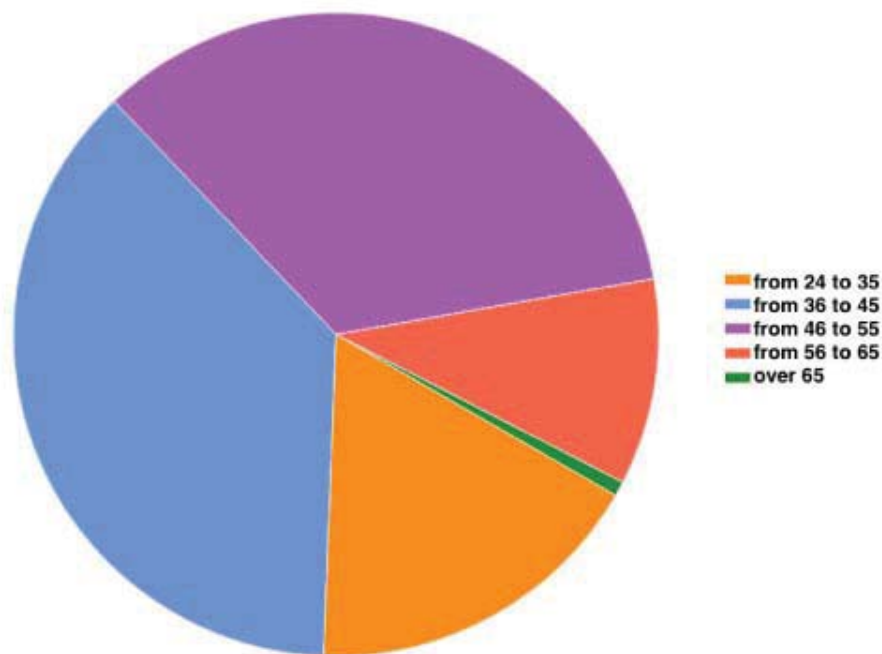


Figure 2. Distribution of participation by age

As mentioned earlier, most of the professor-advisers carry out their professional activity outside the UNED; for that reason, we consider it important to know if their "main" jobs are related to education, as the possible use of web 2.0 may somehow be transferred reciprocally from the presential university and even from other academic levels. As for this element, we can affirm that more than two thirds of the educators surveyed work within the education sector.

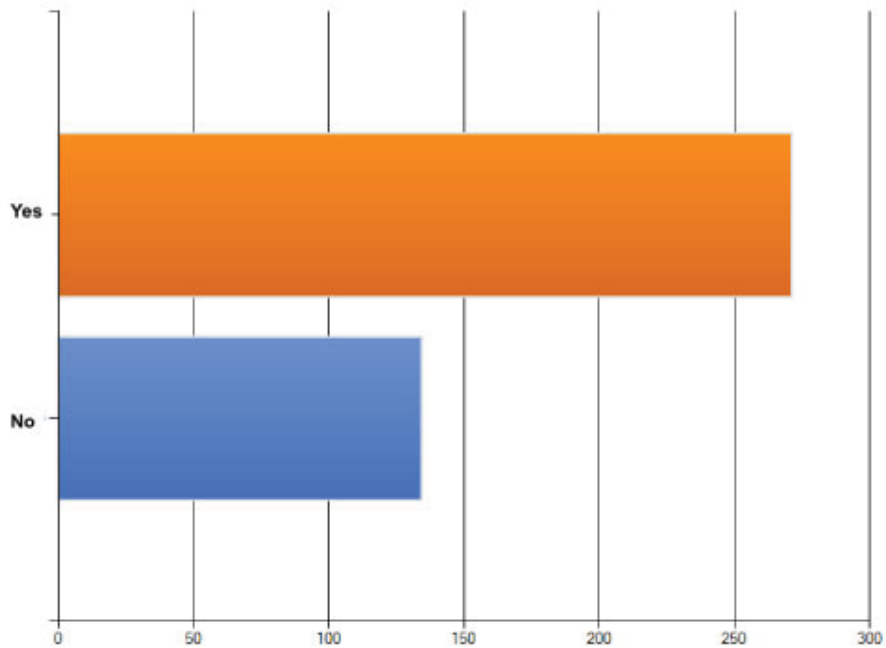


Figure 3. Professional activity of the educator outside the UNED and their connection to education

Another interesting fact to consider when analyzing the data is the number of years of work carried out at the partner institution. We believe that this information can enhance the profile of the UNED educator as far as web 2.0 use is concerned. Logically, most of the educators that participated in the course (nearly 48 %) have worked at the UNED for less than 5 years and require the completion of the entire course in order to obtain the *Venia Docendi*.

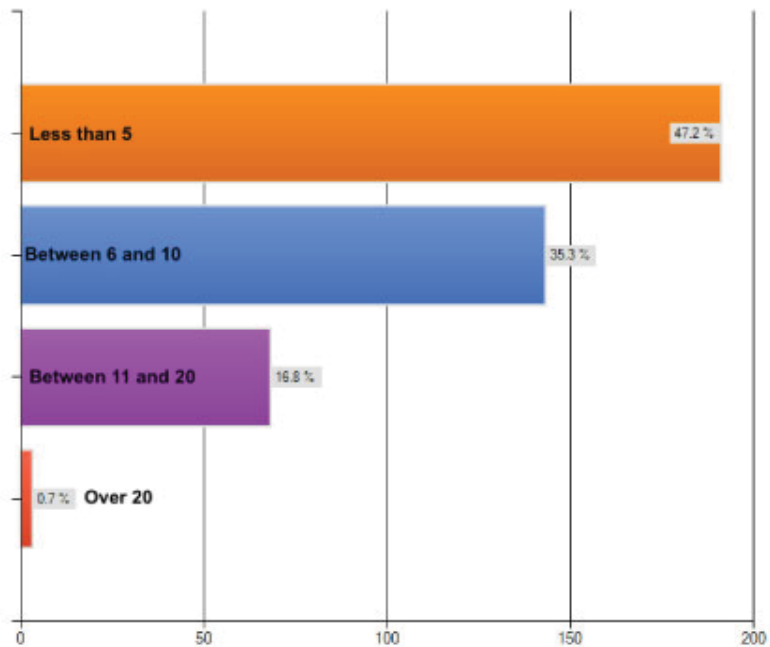


Figure 4. Distribution of participation by years of work at the partner institution

By areas of knowledge, the professor-advisors attached to the School of Psychology were the group with the highest participation, accumulating 15.7 % of the total surveys.

The other three schools that yielded a large number of educators are the schools of Law, Geography and History, and Philology. These three, plus psychology are responsible for more than 50 % of the responses obtained. This data actually matches up with the number of students registered in the different schools, from what can be gathered from one of the last statistical studies from this faculty (Office of Planning and Quality Control of the UNED, 2009)

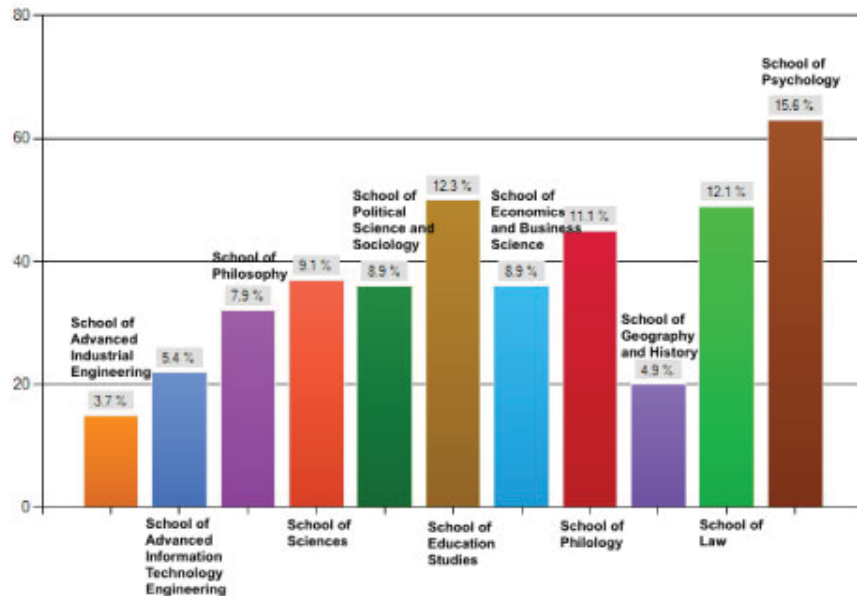


Figure 5. Area of knowledge most closely related to subject matter taught by the professors/tutors

## Use of 2.0 resources relative to age and gender groups, and field of expertise

As mentioned earlier, the survey was designed so that if a participant declared that he or she did not use or were not familiar with 2.0 resources that particular survey would conclude immediately. To that effect, of the 402 initial participants, 37 proceeded in that manner, leaving the sample at 365 educators who stated that they were familiar with and used 2.0 tools. As for the group of faculty that has not used or is unfamiliar with the 2.0 milieu (37) 18 of those surveyed claimed not to know (and consequentially, not to use) the 2.0 environment. The rest (19), declared to "know of but not use" said resources. As such we find it very interesting to know the possible relationship existing between the personal traits and this initial "abandonment" within the survey:

### The "age" variable

According to the findings (Table 1), we can presume that a logical relationship exists between age and the possible use of the technological resources at the service of education. Authors like Lankshear and Knobel (2008) also present arguments along this same line when they describe the "Mentalities" and use of technological resources within the context of the knowledge society. In the figure below we can see how the percentage of educators who use these resources decreases as the age of those surveyed increases: in the case of the age group of 24 to 35, almost 16 % declare a "very frequent use", compared to 2.5 % of the educators from 56 to 65. We have suppressed the data related to the over 65 age group due to the limited representation of the sample (0.7 % of the total). In contrast, only 1.4 % of the youngest age group claimed not to be familiar with/ not to use web 2.0 compared to 17.5 % of the oldest age group. According to these findings, a logical relationship between age and knowledge and the use of the collaborative web's resources appears to exist.

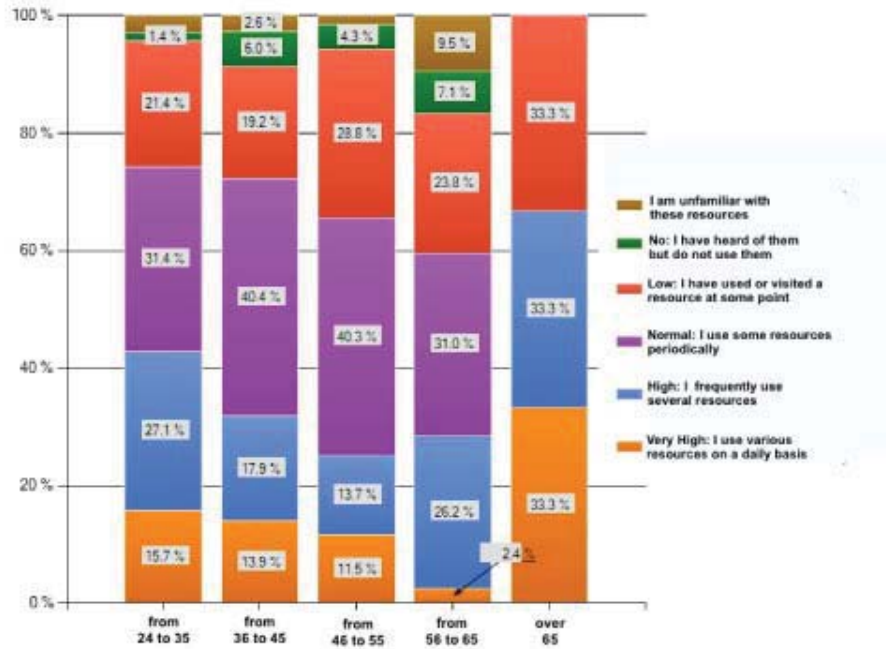


Figure 6. Degree of use of 2.0 resources

### The "gender" variable

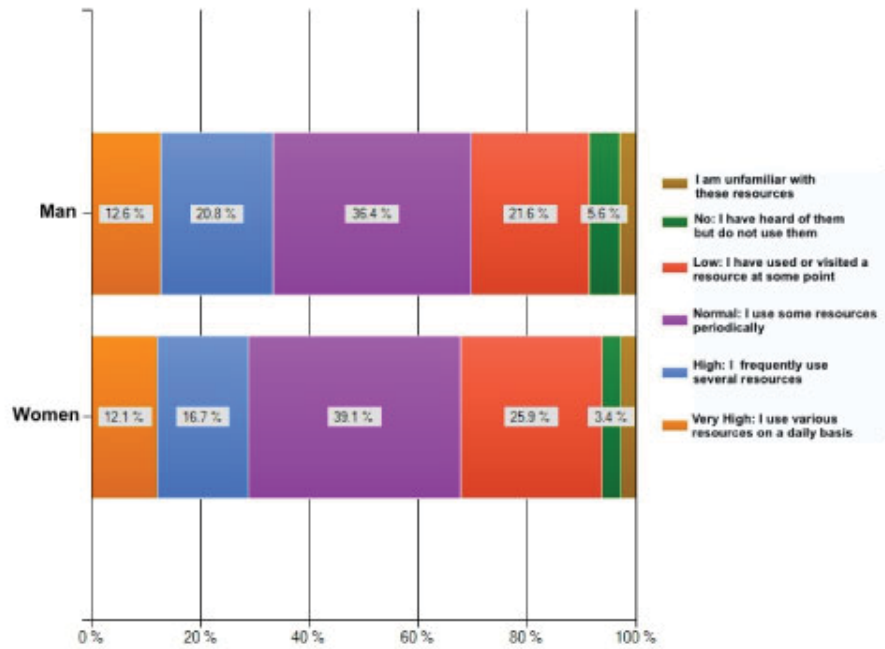


Figure 7. Degree of use of 2.0 resources and gender

According to the data collected no relationship between the gender of the educators and use of web 2.0 resources appears to exist.

### The "professional occupation outside the UNED" variable

We have not found any correlation between the professional occupation of the educators and higher or lower usage of the collaborative web's tools.



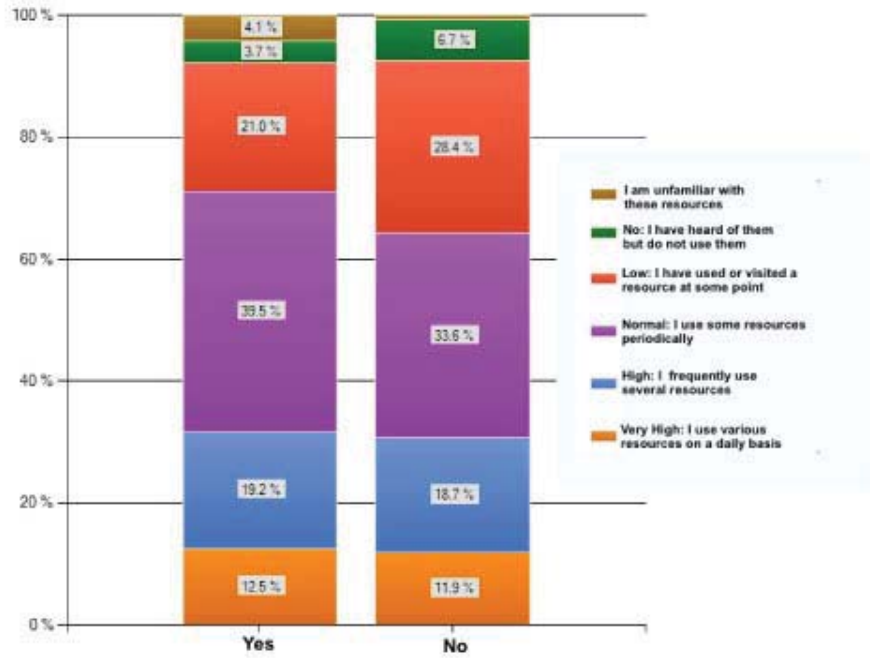


Figure 8. Degree of use of 2.0 resources and relationship between the teaching/advisory staff and education in their professional occupation.

### The “years of didactic experience” at the partner institution

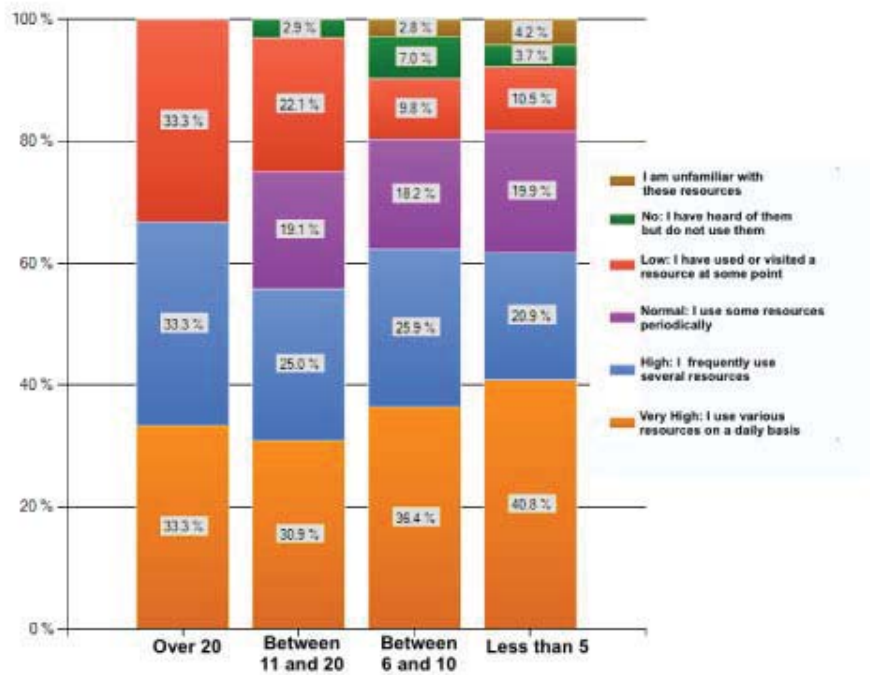


Figure 9. Degree of use of 2.0 resources and years of didactic experience at the partner institution

Within the context studied, the educators with fewer than 5 years of teaching experience at the partner institution are the subjects who claimed to be familiar with or to use 2.0 resources. There appears to be a trend towards awareness of these resources among the educators–tutorial staff with fewer years of teaching.

### The “area of knowledge” variable

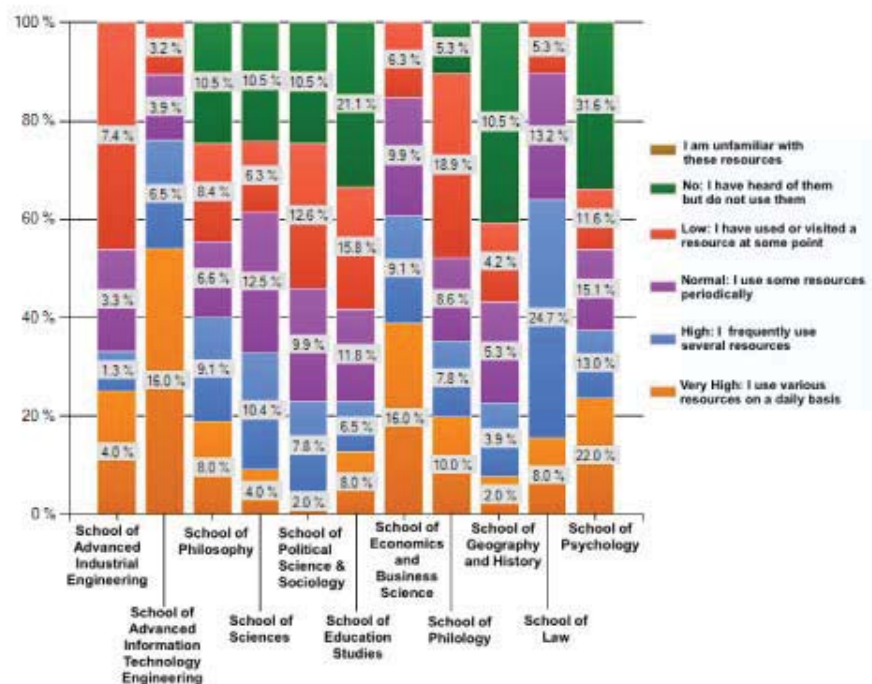


Figure 10. Degree of use of 2.0 resources by schools/faculties

In light of these findings (Figure 9) we can deduce that the educators from the field of psychology (22 %) information systems engineers (16 %) and education (16 %) claim a greater knowledge and/or more frequent use of the web 2.0 resources. In contrast, and ironically it is also the professors-advisers connected to the Schools of Psychology (31.6 %) and Law (21.1 %) who profess not to use the web 2.0 tools.

Based on this initial analysis we can assert that, as regards the personal characteristics from the study sample, we are able to define the profile of the teaching professional who uses 2.0 resources as a young professional from 24 to 45 years of age, with limited teaching experience at the partner institution and who is professionally linked to the fields of psychology, engineering and education.

Next, we will address the direct perception of UNED's professor-advisory staff regarding their knowledge and use of 2.0 resources and see if they can provide the information necessary to respond to objectives 3, 4, 5 and 6 previously set out.

## Data on 2.0 resource usage: kind, degree and mode

In the questionnaire administered, and relative to this aspect, the first question made reference to the objectives of using the 2.0 technological resources contemplated here. Accordingly, 43.8 % of those surveyed claimed to use them for professional activities, while 10.2 % used them for personal activities. 46 % of the faculty admits to making double use of them: both for personal and professional purposes.

In the following section we will itemize the 2.0 resources selected for analysis in this study.

Social networks compose one of the most used web 2.0 applications. They develop applications for asynchronous and synchronous communication and incorporate technical elements that enable the integration of online content. Generically a social network is a structure composed of people (and – increasingly more – of organizations, media and even companies), that are connected through common interest, friendship, kinship, economic exchanges, relationships etc., or shared beliefs, knowledge or prestige.

As for content generation systems, we are going to focus on Blogs and Wikis. The former, the blog, or weblog, is an updated website that chronologically compiles texts and articles from one or more authors, with the most recent entry appearing first, where the author always has the freedom to post what he or she considers pertinent. As for the Wiki, it is a web site whose pages may be visualized and edited, an essential feature, by multiple volunteers through a web browser. The users can create, modify or delete a single shared text. We will also take time to analyze the use of various multimedia elements that enhance and complement the systems described previously, both the social networks and the media for generating the content: videos, audios, images, presentations and documents.

## Social Networks

The use of social networks as a means for learning is a reality increasingly studied in literature on the

subject (Wankel, 2010). In our case, the findings show, on the one hand, a decrease in number of educators that continue with the survey, which reduces the number of participants by nearly 100. This fact is due to two reasons: on the one hand, the expected decrease resulting from those who claim not to use social networks as a resource for professional reasons, and on the other, we understand that those professors who claim a low use, will neither feel capable of specifying what kind of use it is nor what the nature of that use is in terms of learning. As for the social networks (Facebook, Twitter...), most of those surveyed (nearly 60 %) claimed to use it "Little" or "not at all" and as far as the use is concerned, those who claimed to use them, do so mostly as a system of data retrieval. These figures are even lower when it comes to professional networks (Linkedin or Xing, for example), since nearly 74 % claimed "no" or "limited" use and as for the nature of this use, it was logically for "maintaining their professional information updated". In short, data demonstrated that the faculty does not work with this kind of resource despite the fact that it may provide a good base on which to create cooperative and collaborative activities.

## Content generation systems

Regarding the posting of contents using blogs or wikis, the first fact that stands out is that 24 % do not use the weblogs and nearly 40 % do not use wikis. The study reveals that in practice, there are few educators who claim a "high" or "very high" use of these resources (12 for blogs and 15 for wikis). Finally, the findings confirm the role of the educator as that of a "consumer", with a three to one ratio with respect to the role of "content creator". This means that for each blog or wiki that is created, three educators make passive use of it (they consult and subscribe, but do not act as catalysts or promoters of one). Another fact that supports this conclusion is that most of the professors-advisers that use blogs or wikis basically do it to retrieve relevant information.

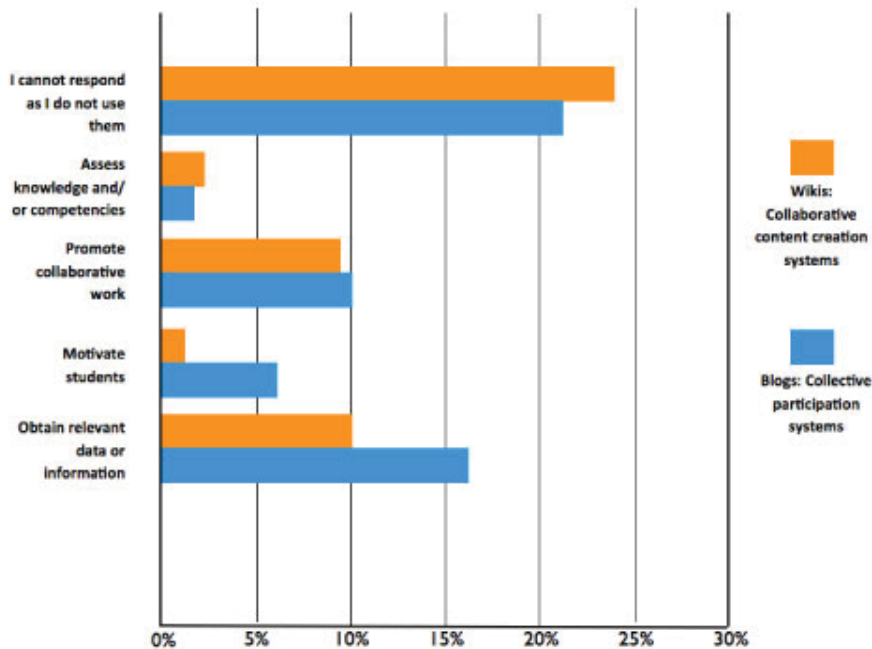


Figure 11. Purpose for use of blogs and wikis

## Multimedia elements

As previously mentioned, we will continue by describing another type of resource that can be used individually or as a means for enriching the content creation systems. We'd like to highlight the following four:

Video, without a doubt is one of the formats with the greatest impact and repercussions on the development of 2.0 sites. And among the video servers, *YouTube* stands out for its volume and social relevance. Various statistics support this assertion:

- Every day more than 2,000 million videos are viewed on YouTube (<http://mashable.com/2010/05/17/youtube-2-billion-views/>)
- Every minute, 20 hours of video is uploaded onto the internet ([http://youtube-global.blogspot.hu/2009/05/zoinks-20-hours-of-video-uploaded-every\\_20.html](http://youtube-global.blogspot.hu/2009/05/zoinks-20-hours-of-video-uploaded-every_20.html))
- Almost 200,000 videos are uploaded daily onto YouTube ([http://www.youtube.com/t/press\\_statistics](http://www.youtube.com/t/press_statistics))

This means that the ratio between users (web surfers who watch videos) and content creators of video formats (internet users who upload videos) is 0.0001, or rather, one video is uploaded for every 10,000 that are viewed.

PodCasting consists of creating audio files (generally in mp3 or ogg format) and subscribing through an RSS file so that a program may be downloaded and then listened to when the user chooses, usually on a portable player.

The third element selected is the location and use of images and graphics as an increasingly used resource by professors of all education levels.

Finally, presentations are an element very much in demand that the students require of the university teachers and which are used more and more as a system of content distribution.

We will begin by classifying the multimedia resources mentioned above according to use, making a distinction, as we did earlier, between "content consumers" and "content creators", and then we will analyze how they are used.

## Usage modality and degree of utilization

In accordance with the data obtained, we can observe that the resource with the highest demand for access is video, followed by "images", "documents", podcast and finally "presentations". We may recall that in the survey, in order to facilitate comprehension about just how each resource was used, we illustrated the fact by using some of the most widely used server names or "brands" (for example, YouTube and Googledocs).

As for the "content creator" role, the findings confirmed that we are far from considering a university professor a catalyst for web 2.0, at least as far as its utilization for educational purposes is concerned. In this context, we found that the "presentations" are considered the most widely used tool, with a ratio of almost two to one (for nearly every three presentations accessed, one was "uploaded"). However, we should remember that this is the least utilized element, as explained in the previous paragraph. In contrast, the podcast boasted a slightly small ratio, almost one to twenty. The remainder of the multimedia material analyzed registered much lower ratios.

The next aspect to be analyzed deals with self-assessment which the educator makes of his/her "degree" of utilization of these resources. The most common response in the case of "images", "documents" and "videos" was "normal", whereas in the case of "presentations" it was "little" and for podcasts, "nothing" (with a striking 61.2 % of the responses).

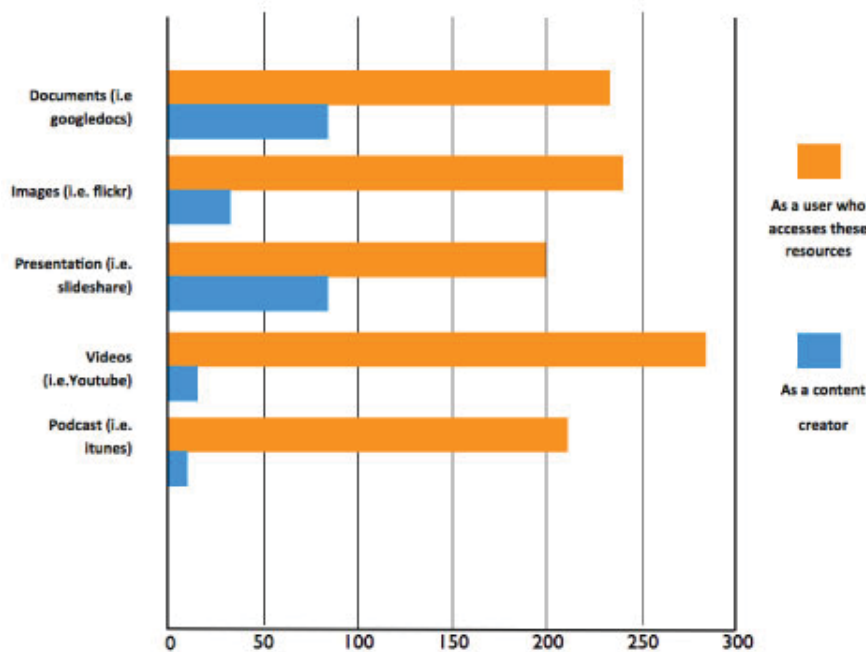


Figure 12. Usage modality of 2.0 multimedia resources

## Purpose of use

The majority of the TRS surveyed claimed to use these resources for information retrieval, which was the

most prevalent aspect in the case of videos, presentations and images. We should point out here, once again, the passive role of the internet user, as we understand this retrieval of data no as access to tangible knowledge produced by students (learning assessment) but rather as a quest for data and information distributed by other colleagues via internet. In the case of documents, the educators of the UNED use them as a way to distribute content, which is logical, as many professors utilize web 2.0 as an alternative to learning management systems (LMS) such as Moodle, Blackboard and Alf.

	As a way to distribute content,	As a data/ information retrieval system	As a content improvement and updating system,	I cannot respond as I do not use it	Number of Answers
Documents (i.e googledocs)	26,1% (80)	35,8% (110)	27,0% (83)	11,1% (34)	307
Images (i.e. flickr)	14,4% (41)	39,3% (112)	17,5% (50)	28,8% (82)	285
Presentation (i.e.slideshare)	27,0% (78)	34,6% (100)	19,7% (57)	18,7% (54)	289
Videos (i.e.Youtube)	13,7% (41)	58,5% (175)	16,4% (49)	11,4% (34)	299
Podcast (i.e.iTunes)	5,2% (14)	35,8% (97)	8,9% (24)	50,2% (136)	271
					25

Figure 13. Purpose of utilization of 2.0 multimedia resources

In the case of podcasts, the data is consistent with that analyzed in the section "Usage modality and degree of utilization" given that that the most common response is "I cannot respond as I do not use it". Podcasts are one of the great "neglected" tools of higher education. To that effect, it is convenient to reflect that many American and European universities utilize this resource on a regular basis, with initiatives such as iTunesU (<http://www.apple.com/apps/itunes-u/>)

## Data organization systems

Whereas in the previous section we discussed the utilization of multimedia resources as tools in learning assessment, in this case, we intend to take an in-depth look at other, no less important, resources: those used to improve data organization, always within the context of web 2.0. With this in mind, we have selected three resources that appear to be more closely related to our object of study, e-calendars, RSS readers and surveys.

## Degree and purpose of usage

In general, the response most often given was "nothing" in two of the resources studied here with nearly 50 % in the case of the RSS and e-calendars, and "little" as the most selected response with 36 % in the case of the questionnaires and surveys.

Although the data regarding the educators that use them is quite limited, in the following figure we can see the aim of the professors who utilize it. We can verify that in all three cases, the responses are consistent with the degree of utilization: the educators do not respond because they do not use them. Although it may be a residual piece of information, we'd like to mention that in the case of e-calendars, the second most common response of the professors was that they use them as "data distribution system" and as "as a data retrieval system" for RSS readers and online surveys and questionnaires.

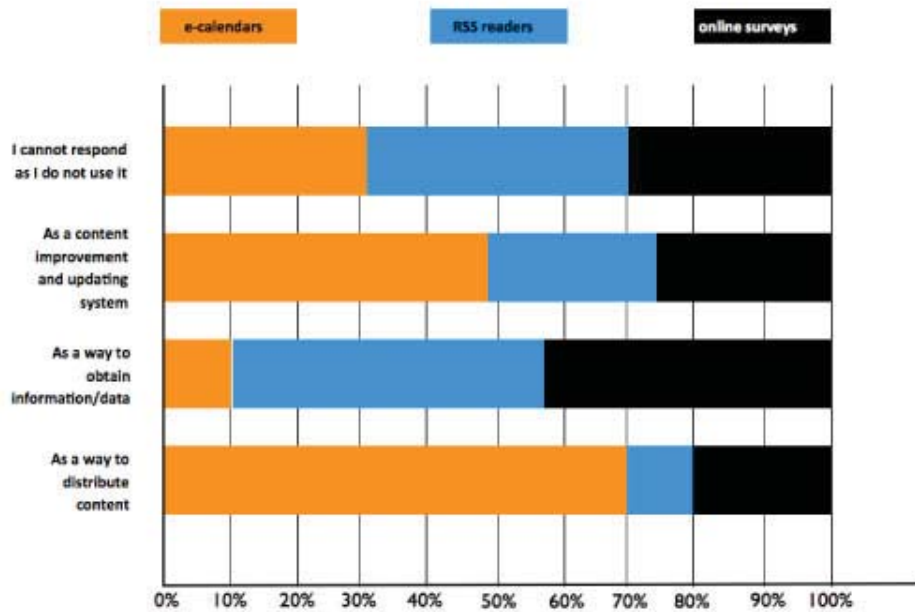


Figure 14. Purpose of use of data organization systems

## Integration of the 2.0 tools with LMS

An LMS (*Learning Management System*) is *software* that is installed in a web server to administer, distribute and control the non-presential training activities (or e-learning) of an institution or organization. Specifically, the UNED has developed its own open code LMS, called aLF, designed by the Innovation department of the UNED. Most of the online courses, both undergraduate and graduate, are taught within the context of this virtual setting. It is important to highlight the fact that all of the educators of the UNED are required to be familiar with and to utilize this platform, since it constitutes the learning environment and the communication between the students, professors and advisory faculty. aLF is comprised of a series of resources that we can classify into three large groups: learning (online materials, presentations, videos...), communication (forums, messaging, chats) and assessment (test simulator, surveys, questionnaires...). Most of the resources available in aLF can be replaced, one way or another, by others that are easily found on the web 2.0. Therefore, we believe it is of paramount importance to know the degree of integration of the tools on the collaborative web.

The data appear to reflect a utilization outside aLF (46,6%) such as complementary material for consultation or practices outside the classroom (documents, practices, exercises) and only 19.6 % claim to use it as a complement to aLF (for example, embedding a video or a presentation created or found on a 2.0 multimedia provider). This data seems to indicate a kind of "double tutorial activity", since on the one hand, the work carried out is centred around the institutional platform (basically for clearing up doubts and working with forums) and, on the other, 2.0 resources are located and utilized as learning and reference material outside the presential class.

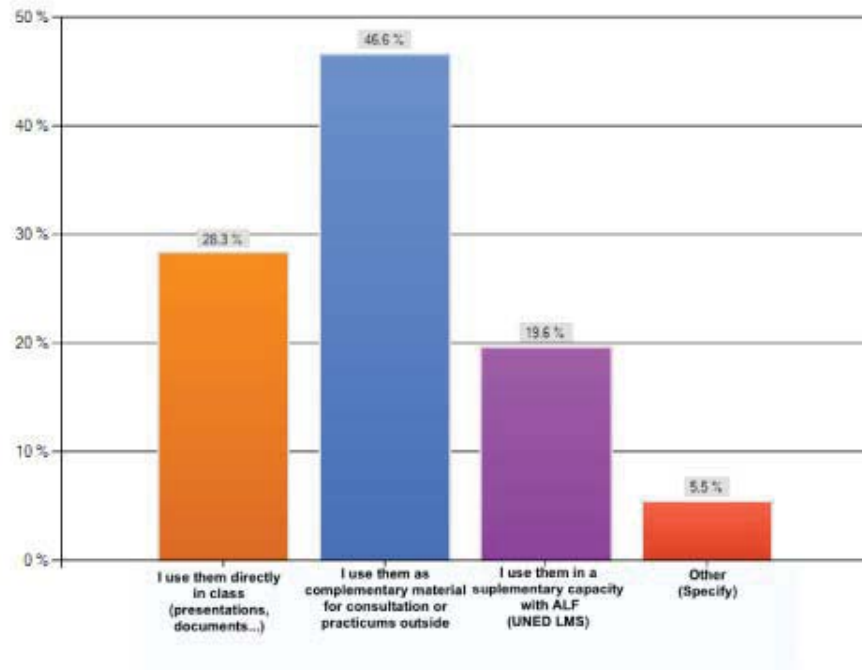


Figure 15. Integration of 2.0 resources with the institutional LMS (aLF)

## Perception regarding the potential of the 2.0 resources

Another relevant aspect in the study was to identify the perception of the UNED's tutorial staff regarding the potential of these resources as specifically pertains to higher learning. The data reflects a "high" or "very high" perception (more than half of the participants) and "normal" depending on its use.

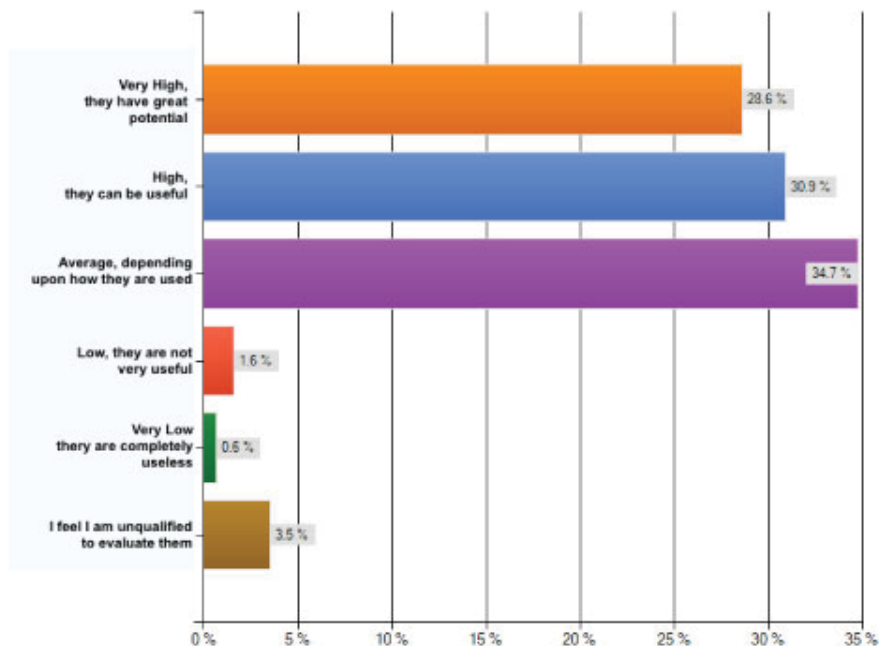


Figure 16. Perception of the educators regarding the potential of 2.0 resources

## Training demands

Considering the importance the teachers have placed on the utilization of these methods, it seems logical to know which training demands the teaching staff consider to be the most relevant to achieving an adequate formation and/or updating in this context. Therefore we asked them to choose from three options:

- Technical aspects (operating systems, configuration, ...)
- Didactic aspects (potential of the different resources to optimize and enhance the learning assessment process)
- Organizational and management aspects (content, processes and kinds of use, roles ...)

The findings show a high interest as regards the first two sections: didactics and organization, whereas the technical kinds are considered to be less relevant.

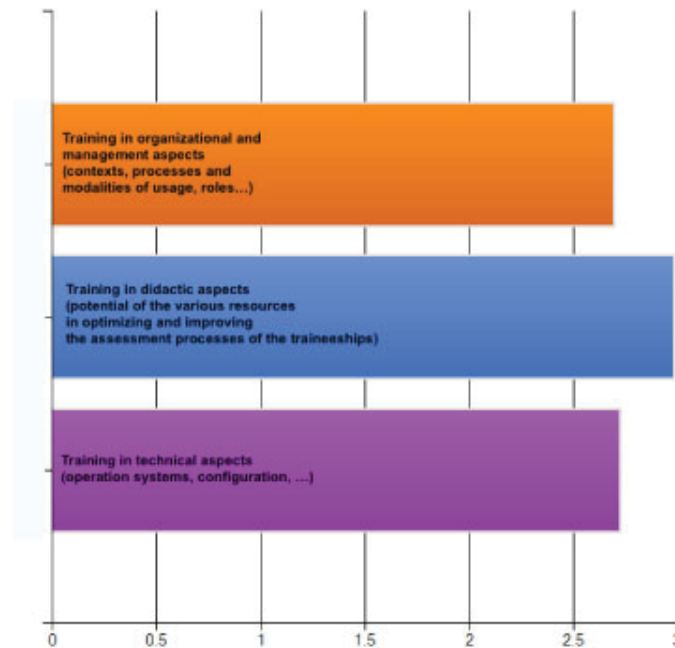


Figure 17. Formative training demands regarding the use of 2.0 resources

Finally, the majority (65 %) of the faculty-advisors tend toward a combined training model which combines some presential sessions (beginning and end) and *online* work.

## Discussion

Web 2.0 applications are going to play an important role in universities in the forthcoming convergence towards the European Higher Education Area (EHEA) due to three factors we believe should be noted: a) the internalization of higher education b) the demands of the new teaching-learning processes and c) the need for the universities to innovate and incorporate new technologies. However, this will not be easy as there are many obstacles in the way, like for example a) there is currently no existing corporative culture which provides meaning and value to the 2.0 resources b) most of the educators have neither the training nor the knowledge necessary to incorporate this kind of resource into their teachings.

Once the results of the study have been presented, it will be time to carry out an exercise in synthesis with the aim of extracting the most relevant findings of the study:

1. As regards the personal characteristics of the sample group. Studied here, we can define the profile of the teaching professional who utilizes the 2.0 resources as a professor-tutor between 24 and 45 years of age, with little teaching experience within the sphere of the UNED and the partner institution and professionally connected to the study of psychology, education and computer engineering.
2. As for the utilization of the 2.0 resources in accordance with the role of "content consumer" or that of "content creator", we have concluded that most of the faculty analyzed here adopts the first of these.
3. In view of the results obtained we can presume that the educators from the fields of psychology (22 %) computer engineering (16 %) and education (16 %) claim a greater knowledge and/or utilization of the web 2.0 resources. In contrast, and paradoxically, it is also the professors-advisers connected to the Schools of Psychology (31.6 %) and Law (21.1 %) who claim not to use the web 2.0 tools.
4. The degree of self-perceived knowledge that the educators claim to possess initially appears as "normal" but as they are asked about use or creation of specific applications they then claim a lack of knowledge of the same.



5. The teaching staff claim to use the 2.0 resources “parallel” to the institutional platform of online teletraining of the UNED (aLF)
6. The educational needs demanded centre around didactic aspects (potential of the different resources to optimize and enhance the assessment processes of learning) and organizational and managerial aspects (contexts, processes and methods of utilization, roles, ...)

We find ourselves faced with the need to shape new learning environments focused on students and which enable them to remain receptive to the conceptual, scientific and technological changes that will continuously appear throughout their job activity. That is why the incorporation of the ICTs in the universities, and more specifically the new applications (currently, the web 2.0, for example) appear to be necessary. Once the educators are familiar with these resources, they will be used to create situations in which the student is capable of demonstrating what has been learned and this will provide the teaching professional with information regarding their advances and achievements.

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[1] Cooperation: overall international processes of a group in order to reach specific goals and of the software tools designed to offer support and facilitate the work.

Collaboration: set of instruction and training methods supported by technology, as well as strategies for favouring the development of mixed abilities (learning and personal and social development) where each member of the group is responsible for his/her own learning as well as that of the rest.

[2] In accordance with UNESCO (1998:1), when we talk about higher education, we are referring to “all types of study, training or investigative training in post-secondary education, taught by the university or other teaching establishments accredited by the competent State authorities as centres of higher

education”

[3] Higher Education: New challenges and emerging roles for human and social development. IV International Conference in Barcelona on Higher Education, 31 March and 1-2 April of 2008, Barcelona (Spain). [http://www.guninetwork.org/guni.conference/2008\\_guni-conference](http://www.guninetwork.org/guni.conference/2008_guni-conference) (visited: 2012-12-18)

[4] [http://www.alzado.org/articulo.php?id\\_art=114](http://www.alzado.org/articulo.php?id_art=114)