

Web 5.0: the future of emotional competences in higher education

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Abstract Achieving a balance between the development of information and communication technologies (ICT) development and teaching competences has become essential. The rapid evolution of the Web has presented universities with the challenge of preparing today's academic staff for the ICT of the future. The European Higher Education Area has adapted to ICT, proposing a conceptual and methodological change in teaching–learning processes in Spanish universities. In this new scenario, the education of students via the Web has become a key factor that requires higher education teachers to have new emotional competences. Although affections, feelings and emotions have been gaining relevance in society and scientific thought for more than a decade now, in the future, we will be dealing with a sensory emotive Web (Web 5.0) and, more than ever before, there will be a deep need for teachers to use and promote intra- and interpersonal emotional competences. In this respect, this paper suggests that the use of rationalistic methodology alone, in this era of sensory and emotional knowledge (present and future), is a mistake. Teaching staff need to develop emotional competences and transmit them to their students, in order to produce graduates who will be more adaptable to new socio-professional contexts.

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Introduction

One function of universities is to train highly qualified graduates and responsible citizens who are able to address the needs of all aspects of human activity. University qualifications must be able to rise to the challenge of modern times, providing professional training that combines high level theoretical and practical knowledge that constantly adapts to society's present and future needs. This is where the European Higher Education Area (EHEA) comes into play.

The EHEA has meant a conceptual and methodological change for Spanish universities precisely due to their desire to find a balance between new social demands and teaching–learning processes. Within the European Union's action plan linked to the use of information and communication technologies (ICT) called “designing tomorrow's education”, one initiative specially targets ICT use in universities as an application of innovative methods in the teaching–learning process. ICT-based learning has been supported by learning theories that emphasise the creation of an environment where learners can access and share knowledge and resources with one another (Wang 2010). In this sense, ICT-based learning seems to be able to support and stimulate the learning process and enhance learning performance (Lee and Woods 2010). In addition, technology-enhanced learning through Web-based learning supports learners by such ways as facilitating and providing feedback, thereby reducing the effort expended on organizational issues and improving learning effectiveness (Shih 2010, 2011). This kind of learning requires teaching staff to use new teaching tools that involve techniques and competences they are unfamiliar with. In this new scenario, training via the Web has become a key issue. However, ICT-learning is not just some technological novelty applied to the traditional educational model. Constructivist learning cannot be achieved by the mere introduction of ICT, but must be understood as a type of education whose success largely depends on the humans behind it (Castro 2003). For this reason, new professional competences are required from university teaching staff to satisfy the changing needs of this knowledge society in which universities are also immersed. Thus, teachers need training in the use of ICT in order to transform the traditional teacher-centred system into a system based on critical thinking (Akyeampong 2009).

There is, however, a problem with adopting ICT in the teaching–learning process through e-learning and therefore the Web. Introducing the use of ICT requires a change in universities' organisational culture and commitment from the entire community. One of the challenges facing universities is that of preparing generations of professors who are able to select, update and use knowledge in a specific context, who are able to learn in different contexts and ways throughout their lives and who can understand the potential of what they are learning so they can adapt that knowledge to new situations (Bozul and Canto 2009). In short,

teachers must acquire the competences necessary to develop e-activities via the Web which make students truly active so that e-learning actually takes place rather than the e-reading process it can become. In particular, the rapid evolution of the Web, which affects the quality and context in which higher education takes place, intensifies the need to develop teachers' emotional competences. This work aims to highlight the relevance of emotional competences in the context of ICT and in a new scenario led by Web 5.0 where, more than ever, there will be a deep need to exercise and promote intra- and interpersonal emotional competences in teaching staff.

The paper is structured as follows: “[Evaluation of the World Wide Web](#)” section deals with the stages in the evolution of the Web. “[An ICT-adapted teacher profile: emotional competences](#)” section defines the ICT-adapted teacher profile based on emotional competences. “[The nexus between Web 5.0 and teachers' emotional competences](#)” section presents the link between Web 5.0 and emotional competences. Finally, “[Conclusions](#)” section presents the conclusions and future research lines.

Evolution of the World Wide Web

In the past, the printing press established a strong division between the people who were able to access the knowledge it distributed and those who were not. The same issue has now arisen with the Web, together with the additional problem of the speed of its transformation (Cabero et al. 2007). Each new period in the evolution of the World Wide Web (WWW) has transformed the way business is conducted and companies themselves (Kambil 2008). However, these different stages in the evolution of the Web, each with a series of associated concepts, are used indiscriminately with no knowledge of their differences, contexts and links. The short description of the Web's evolution presented below following Kambil (2008) may be useful for pinpointing the stage we are at in this dramatic transformation.

Initially, use of Web 1.0,¹ the basic internet Web, was associated with major companies. Its use was limited to publishing corporate information, developing marketing and sales plans and transactions with customers. This Web ushered in the first online strategy for businesses (Berners-Lee et al. 1992).

Then, Web 2.0,² the social Web, a platform for collaboration, offered users a new version of WWW, not so much in terms of updating the Web's technical specifications, but rather in terms of the changes software developers and end users made to the way it was used. Web 2.0 is qualitatively different from previous Web technologies as it has Web applications that facilitate information sharing, interoperability, user-centred design and collaboration in the WWW. Examples of Web 2.0 are Web communities Web services, Web applications, social network services, video hosting services, *wikis*, *blogs*, *mashups* and *folksonomies*, among others (O'Reilly 2005).

¹ Tim Berners-Lee was the creator of the WWW.

² The term Web 2.0 (2004–to the present) is closely linked to Tim O'Reilly, due to the conference on Web 2.0 of O'Reilly Media in 2004.

The late 1990s saw a change in the role of internet users as they began to create content and social value. The symbols of this era include *YouTube*, *Facebook*, *LinkedIn*, *del.icio.us*, *Wikipedia*, among others. Internet then became a cooperative platform in which collective power and networking effects opened up the possibility of generating extraordinary value. These social changes in turn caused changes in business models that attempted to make the most of each individual contribution and prepared to coexist in a definitively virtual environment. Although it remains a challenge, or is still unfinished, the Web 2.0 era is giving way to Web 3.0 or what is known as the semantic Web.

Web 3.0³ combines human and artificial intelligence to provide more relevant, opportune and accessible information. Web 3.0 has a more powerful language derived from neuronal networks and genetic algorithms, with a particular emphasis on analysis, processing capacity and how to generate new ideas based on user-generated information. Web 3.0 is a neologism used to describe the transformation of the Web into a database, a way of making content more accessible through multiple *non-browser* applications, artificial intelligence technologies, the semantic Web, the geospatial Web and the 3DWeb. The market often uses it to promote improvements in relation to Web 2.0. There is considerable current debate over the significance and most appropriate definition of Web 3.0 (Zeldman 2006).

The fourth step in the evolutionary process is occupied by Web 4.0 based on wireless communication (mobile devices or computers) connecting people and objects whenever and wherever in the physical or virtual world in real time. For example, the GPS that guides cars and now helps drivers to improve the planned route or save fuel will shortly save them from having to handle it. This 4.0 or mobile version is ready to take off, with an apparently remote Web 5.0, the “sensitive” Web, hard on its heels (Kambil 2008).

Various futuristic terms are currently being used in relation to technology use. Web 5.0, the sensory and emotive Web, is designed to develop computers that interact with human beings. This relationship will become a daily habit for many people. Although at the moment the Web is “emotionally” neutral, that is, it does not perceive what users feel and although emotions are still difficult to map, there are already technologies that can measure their effects. One example is www.wefeelfine.org which tracks emotional phrases on the Web, categorises them and registers the frequency and location of *clusters* of sentiments. Another example is the company Emotiv Systems which has created neurotechnology. Using headphones, users can interact with content that responds to their emotions or changes the facial expression of their avatars in real time. If interactions can then be personalised to create experiences that excite users, then Web 5.0 will undoubtedly be more affable than its predecessors.

In short, the fact that the Web’s evolutionary process has modified business orientation suggests that it will unequivocally affect the quality and content of higher education. The current economic context is characterised by change and the appearance of new models of production and innovation based on know-how, its applications and information processing. The links between higher education, the

³ The term Web 3.0 first appeared in 2006 in an article by Jeffrey Zeldman, a critic of Web 2.0 and associated with technologies such as AJAX.

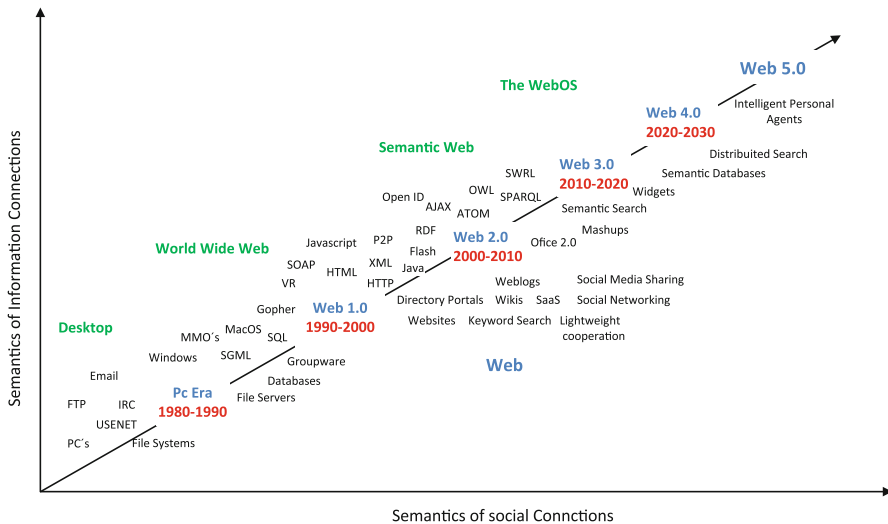


Fig. 1 Evolution of World Wide Web. *Source* Own elaboration based on radar networks and Nova Spivack, 2007—www.radarnetworks.com

world of work and other sectors in society must therefore be strengthened and renewed and it is therefore essential for institutions to satisfy these new social demands. In particular, there must be a balance between the new development of ICT and teacher competences.

The evolution of the Web is shown in graph form in Fig. 1.

An ICT-adapted teacher profile: emotional competences

In the modern knowledge society, citizens must have sufficient skills to handle information, transform it into knowledge, learn to learn and continue learning throughout their lives. Obviously, therefore, people need to master ICT used in society and be able to locate information and process it so that it becomes knowledge (Beltrán and Vega 2003). This new society requires flexible organisational structures in higher education. These structures must enable access to knowledge and critical personal training to promote interpretation of information and generation of own knowledge (Hinojo 2006; Hinojo et al. 2009). Universities must design learning situations which favour the acquisition of knowledge, skills and attitudes that form part of the set of competences in the training profile (Yániz and Villardón 2006). In order to manage in this new scenario (although only potential as yet), teachers will have to master new competences and skills such as those that Longworth (2003: 112) and Cabero et al. (2007: 174) point to:

- *Learn to learn* know one's own style of learning, be open to new learning techniques and new knowledge and want to learn with confidence in oneself.
- *Apply new knowledge to practice* see the connection between theory and practice, and put knowledge into action.

- *Question and reason* be aware that change is continuous, permanently want to improve procedures and processes and never be satisfied with the status quo.
- *Administer oneself and others* establish realistic goals, recognise the divide between reality and what is being proposed and know how to close it and continuously develop personal skills.
- *Administer information* gather, store, analyse and combine information and use information technology.
- *Communication skills* express oneself clearly orally and in writing in formal and informal situations, convince others and listen to others.
- *Work as part of a team* share information and knowledge, receive information and knowledge and participate in setting goals and achieving common objectives.
- *Problem-solving skills* creativity and innovation.
- *Adaptability and flexibility* face change confidently adapts to new situations and tasks and be ready to change one's personal direction.
- *Ongoing learning* permanent updating of personal skills and competences.
- Celebrate the habit of learning.

As the Chilean Ministry of Education proposed in its 2006 document, teachers should only be considered competent in ICT terms if they are competent in at least five related areas: pedagogy, knowledge of social, ethical and legal aspects related to the use of ICT in teaching, ICT supported school management, the use of ICT for professional teacher development; and technical knowledge. This study considers each of these areas to be of great interest in shaping teachers' basic knowledge. However, a slightly more in-depth analysis, like that of Bozul and Canto (2009), suggests that the teacher profile must be also based on competences which are the fruit of dialogue and consensus. This approach fulfils two important functions for ongoing improvement of the profession: the structure of the initial and ongoing training and the promotion of professional development throughout a teacher's career and of the profession itself.

This study, however, goes a step further and following the Tuning Project (2003) differentiates between specific and generic competences. Specific competences concern the training of University teachers in the discipline they teach and are acquired through degree, postgraduate and doctorate studies in the respective faculties and schools. Generic competences, according to Hué García (2007), can be divided into three groups: information management (computers and languages mainly); pedagogy (using didactic techniques); and the largely forgotten personal emotional competences described below.

Since the 1990s with the introduction of the "emotional revolution", the concept of emotional education has gained acceptance among those involved in the world of education. According to the benchmark theoretical framework, emotional education is understood to be any educational action aimed at developing emotional competences that will contribute to greater individual and social well-being (Bisquerra and Pérez 2007). Some education experts recognise the fundamental contribution of positive emotional aspects to individual training (e.g., Shapiro 1997; Bisquerra 2002). Thus, to paraphrase Pérez and Ribera (2009: 253): "Emotional

competences include the set of knowledge, abilities, skills and attitudes required to understand, express and appropriately regulate emotional phenomena and are structured in five dimensions: emotional awareness, emotional regulation, emotional autonomy (self-management), social competence, life skills and well-being which in turn can be subdivided into more specific components. The concept of competence embraces knowledge, know-how and knowing how to be”. Table 1 shows the five main dimensions for an emotional competences-based teacher profile.

Thus, personal emotional competences refer on the one hand to self-improvement skills such as self-knowledge, self-esteem, self-control and motivation, creativity, the ability to change or take decisions; and on the other, relationship skills such as

Table 1 Dimensions addressed by emotional competences

Emotional competences
Self-awareness
Emotional awareness
Correct self-evaluation
Self-confidence
Self-regulation
Self-control
Confidence
Awareness
Adaptability
Innovation
Motivation
Impulse to achieve
Commitment
Initiative
Optimism
Empathy
Understanding others
Developing others
Guidance service
Promoting diversity
Political awareness
Social skills
Influence
Communication
Conflict management
Leadership
Catalyst for change
Link builder
Collaboration and cooperation
Team spirit

Source: Original work based on Salovey and Sluyter (1997)

empathy, the ability to establish appropriate communication, to work in a team, to solve conflict, to analyse the needs of society or markets, to be a leader in different social situations (Hué García 2007). At some point in the near future, it is expected that communication and emotional education will interweave (Etchevers 2005).

The nexus between Web 5.0 and teachers' emotional competences

In this new context of rapid development of ICT, the first question we must address is: *Why is it so important for teachers to acquire and develop emotional competences in an educational context of e-learning?* Unlike interactions which take place in an immediate physical and social context or in real space, communicating and relating on the Web requires interactions in a virtual environment or cyberspace (Cornwell and Lundgren 2001). Therefore, if in the future we are to be faced with a sensory and emotive Web (Web 5.0) that is designed to personalise interactions between computers and humans and to create experiences that excite users, teachers must consider this context as the one where they must make their training project operational. Here is where the fundamental difference between learning to use ICT and using them as tools for learning must be highlighted, this is where emotional competences become important as, more than ever before, there will be a deep need to exercise and promote intra- and interpersonal emotional competences in teachers.

Consequently, competence training, rather than just the exercise of knowledge and training in order to be able to act in complex contexts, will also require the mobilisation of emotional resources and strategies. To achieve teaching success through the Web, it will no longer be sufficient to have a high intellectual coefficient or broad technical knowledge; teachers must be able to develop abilities such as self-knowledge, self-mastery, zeal and persistence, the ability to motivate themselves and to achieve results together with others. This is where the term emotional intelligence comes into play, gathered and divulged by Goleman (1995) although stemming from the work by Salovey and Mayer (1990). According to these authors, emotional intelligence consists in the ability to manage feelings and emotions, discriminate between them and use this knowledge to direct one's own thoughts and actions. Thus, the skills required for emotional intelligence are related to outcomes in the personal and professional spheres and in daily life in general, and they constitute models of competences (Boyatzis 1999; Boyatzis et al. 2000; Hendlund and Sternberg 2000), in particular mixed models of emotional intelligence that include broader competences of a socio-emotional nature Mayer et al. 2000). It is therefore easy to appreciate the importance of these emotional competences in the educational context of higher university education (Pérez and Castejón 2006). Teachers will need both general and systemic emotional teaching competences that start up and exercise affective and emotional aptitudes, emotional attitudes, values and strategies to activate, deal with and self-regulate that are both general and systemic, with the ultimate aim of extending their applicability from any professional context to the students' own lives (Núñez 2008).

It might seem initially that this proposal of emotional competences is being subordinated to the requirements of the new ICTs, the new economy and/or the labour market; however, this study does not obviate the very important role of these competences in modern, mostly multicultural, societies. Our graduates will be able to adapt better to new socio-professional contexts if teachers develop these emotional competences and transmit them to their students.

Teaching experience

This article looks at the use of Web 5.0 activities in a social science context in terms of design, implementation and evaluation. It also presents Web 5.0 activities that can be integrated into the strategic management classroom, while reporting the results of a project that explored, selected and developed “Web 5.0 activities” for strategic management learners and investigated the usefulness of “Web 5.0 activities” in the strategic management classroom.

First, we explain the design of the teaching experience. Based on the way that we think materials will be created, presented and used on Web 5.0 (in the future), the following types of activities are proposed: (a) pre-created Web 5.0 or similar activities adopting interactive strategic management cases that have already been created by others and are easily accessible on the Web; (b) student task-based Web 5.0 activities making use of a variety of unreal (not yet invented) Web 5.0 resources for communication, information gathering, problem-solving tasks, etc.; and (c) teacher-based Web 5.0 activities employing tailor-made strategic management exercises modified by classroom teachers for their own students.

The website has an introductory page and a session plan page showing pre-created, student-based and teacher-based tasks. In practice, it is useful to have a complete website, containing strategic management learning activities for use in with a syllabus. A planned approach was taken when introducing and incorporating Web 5.0 activities, in the search for new, interesting and authentic materials presented in various media in an effort to meet the diverse learning needs of the student body.

Second, we analyse the implementation of the idea. Teachers need teaching plans containing the contents and procedures of strategic management activities in order to conduct the sessions. Through task-based Web 5.0 activities, teachers can also provide students with strategic management exercises directly related to their classroom lessons. The following description of one student task-based Web 5.0 activity session written by a classroom teacher gives an idea of how the session could be implemented. At the start of the session, students were put into groups of three or four. Each group was made up of students from different nationalities where possible. The online website was written on the board; students were given the activity sheet for that session and some brief instructions. The outcomes for this session were to produce a poster of their news item by the end of the session and use it as part of an oral presentation the following day. Students moved into their groups at the computers. The topics were explained and the groups chose different topics. The teacher’s role was to circulate among the groups and manage students’

emotions. Interaction between the teacher and students was mainly about appropriate news items?

Finally, we analyse the evaluation of the experience. A small-scale study of 120 strategic management students' opinions on the usefulness of the Web 5.0 activities was conducted using a self-report questionnaire. The questionnaire was distributed to the students. The results of the students' responses to the questionnaire are summarised and given in Table 2. The first statement on their enjoyment of the Web 5.0 activities gained full agreement from all students with a mean of 4.85 (out of 5). The students' responses to the seventh item about their willingness to access Web activities outside class time showed agreement from all students with a mean of 4.42.

Overall, the students showed positive attitudes toward the use of the Web 5.0, agreed that they enjoyed the Web 5.0 activities and would like to use more activities during and outside class time. These results reinforce the idea that learners using this type of ICT tool—Web-based formative assessment software—outperform those not using the software (Buchanan 2000). Furthermore, students are more willing to criticise others online because they can post their comments anonymously, which helps them avoid confrontation (Lin et al. 2001; Davies 2003). Moreover, feedback from e-assessment adds value to learning and should form an integral element of all e-learning activities (Deramo 2009). Finally, pioneering practices help students develop various generic skills, such as ICT skills, collaboration skills and organizational skills. They also establish that ICT-based

Table 2 Results of the Experience

Question	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree	Average ratings (SD = 1–SA = 5)
1. I enjoyed the Web activities	0	0	0	30	90	4.75
2. I learned a lot from the Web 5.0 activities	0	0	30	40	50	4.17
3. I found that the website was well presented	0	0	20	60	40	4.17
4. I gained confidence in my ability to use the Web 5.0 for management purposes	0	0	20	70	30	4.08
5. The experiences in Web-based management learning made this course more interesting	0	0	20	80	20	4.00
6. I would like to use more Web 5.0-based management activities during class time	0	0	20	50	50	4.25
7. I would like to access Web 5.0 activities myself outside class time	0	0	0	70	50	4.42

activities are useful in developing a diverse range of student and teacher capabilities and can play a significant role in their learning (Yiu and Ng 2011).

Conclusions

Educational work, in reference to the classics, can be defined as contradictory on occasions because it has to reconcile individual aims with social aims (Núñez 2008). Thus, on this premise, the aim of this work has simply been to grant teachers' emotional competences the importance they deserve by analysing some of the social, affective and emotional factors involved in educational processes and therefore in knowledge.

For the development and implementation of effective pedagogy in Web 5.0 environments, teachers need to become active and critical Web 5.0 users and develop their own skills and strategies for selecting and managing Web 5.0 materials and emotions. Teachers need to select or develop high quality Web 5.0 resources and use the resources through well-prepared strategic management activities. The project website presented in this article can be used as a supplementary resource for teaching management strategy. The effectiveness of the website can be achieved in terms of its ability to elaborate upon management skills taught in classrooms. As the website has been designed in a simplistic format for ease of accessibility and interactivity, it is a reliable site with extensive resources and a number of activities that can be freely used in the classroom. It is recommended that the website be used in conjunction with classroom teaching and should be further developed to improve a broader range of student abilities and motivate student learning. This study provides further evidence of the appropriateness of applying Web 5.0 to generate positive attitudes in the students toward the use of the Web. These results suggest that, in implementing Web 5.0, the focus should be placed on fostering the self-confidence of students and their perceptions concerning Web 5.0. If individuals are struggling, they may actually believe that this new system is too hard to use and that the benefits of using Web 5.0 in terms of performance are outweighed by the effort of using it. Eventually, they may become reluctant to use Web 5.0, thus defeating the purpose of introducing it. Future study can extend the results of this study by analysing the area of self-efficacy and emotions which addresses ones belief in ones abilities to be able to accomplish a specific task, such as successfully using Web 5.0.

Fortunately, more and more people are pointing to the importance of emotions for boosting an exponential improvement in human capital. And so for more than a decade, affections, moods and emotions have been gaining importance both in society and in scientific thought. Following Zaccagnini (2004), we consider that in modern society, emotions have ceased to be a negative element to become a positive one that facilitates action and decision making. In this regard, this study proposes that using only rationalist methodology in this era of sensory and emotional knowledge (present and future) is a mistake. In short, the rapid evolution of the Web has presented universities with the challenge of preparing the teachers of today for the ICT of the future, and we think that the key to teaching success will lie in

commitment to an educational channel that cultivates the acquisition and development of emotional competences. However, it must not be forgotten that although the Web is used to understand, express or deepen interpersonal relations in a way that is quicker, deeper and more direct, the medium must not replace real-life interpersonal relations.

As future lines of research, this work leaves open the empirical field of comparison in different contexts in the same nation and internationally. The study of competences that have not yet been analysed could also be undertaken. Finally, studies of how emotional exchange happens in Web communications could constitute another line of research, as well as analysis of the importance of this emotional communication for people's well-being.

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