Analysis of the Utilization of Web 2.0 Resources in Secondary Education and Advanced Vocational Training Studies

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***Abstract*— This paper presents a study to address the use of Web 2.0 tools in education. The study focuses on secondary education and is limited to the region of Madrid (Spain). The main objectives of the study are to determine the involvement of both teachers and students in the use of Web 2.0 tools. Moreover, we will also examine the different parameters associated with the acceptance and application of Web 2.0 resources. Finally, we will describe the different patterns of interaction of both students and teachers with respect to these digital platforms. As a result, we will be in position of assessing the convenience and acceptance of artifacts based on the Web 2.0 paradigms to be used as effective resources to improve the students' learning experience.**

Keywords-words: Web 2.0, Media Education, School 2.0, Knowledge Society.

I. INTRODUCTION.

The term Web 2.0 Websites comprises those Websites that facilitate information sharing interoperability, user-centered design and collaboration in the World Wide Web. There are several tools that allow to share information in the Web 2.0 such as blogs, wikis or social networks as well as other sites that share resources like Google Drive for documents, Youtube for videos, or Dropbox for online storage. Among these tools, there are also learning platforms like Moodle or Claroline and virtual classrooms such as Edmodo, Virtual Virtual Teacher or Tutor.

Our aims are to analyze the acceptance of Web 2.0 tools in the classroom and the involvement of teachers in their use. Therefore, the main objetives of the research activities reported in this paper are presented below:

1. To perform a study of the use of Web 2.0 tools in the classroom in the region of Madrid and to assess the implication of teachers in their use.

2. To evaluate the acceptance of Web 2.0 tools by teachers.

3. To determine whether the use of Web 2.0 tools is widely accepted by students (according to teachers' opinion).

4. To identify predictive factors for a lower use of Web 2.0 tools by teachers in the classroom.

The rest of the paper is structured as described in the following. First, we will present the state-of-the-art after reviewing the previous research on the use of Web 2.0 tools by teachers. Then, the methodology used to carry out our study will be described. Finally, our main results and conclusions together with some threads to validity will be exposed.

A Web 2.0 site allows users to interact and collaborate to join efforts in the process of creating contents that will remain available for a given virtual community. This approach radically differs from static websites where users are limited to the passive viewing of content that have been created for them.

The main aspects featuring the Web 2.0 technologies are enumerated in the following [9]:

1. The term Web 2.0 groups different interactive approaches that have in mind the social component of the net. Provided with these new mechanisms, Internet has acquire a more participative dimension, enabling the exchange of information and several forms of contact among users through individual blogs, wikis, social network sites (Second Life, Facebook, etc), image or video sharing sites (Flickr, YouTube, etc.)
2. The Web 2.0 is and attitude and not precisely a technology. It's most relevant aspect is that it makes clear the next evolutionary steps of Internet.

Facebook is an example of typical social networking projects that, in general, has been developed using the figure of social networks as the main support for students' learning process. [11]

Free Software is any software respectful to the freedom of its users and to the social solidarity of their communities. It is common to associate Free Software to software with no cost, but this is a mistake, because there are free software that you have to pay for using it. Not every free software is free. And above all not every no cost software is free software. [7]

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To sum up, free software is defined by the four freedoms of software users.

Freedom 0: The freedom to run the program for any purpose.

Freedom 1: The freedom to study how the program works, and to change it for any particular purpose.

Freedom 2: The freedom to redistribute copies.

Freedom 3: The freedom to improve the program, and release your improvements (and modified versions in general) to the public, so that the whole community benefits.

Also you should have the freedom to make modifications and use them in your work or free time privately, without even have to announce that this modifications exists [8].

We will take as a reference some figures in the education in Europe and in Spain. That will show us how important can be the use of the web 2.0 tools for the classroom. All of this will give us an idea of the current situation about this topic, in Europe and in Spain [10].

II. STATE OF THE ART

The Society of Information has risen as the result of the implementation of information and communication technologies (ICT) in daily life. The greater use of the ICT paradigms has changed, in many senses, the way of developing many of the activities of the modern society.

The Knowledge Society arises in the context of the Society of Information. The main characteristics of the Knowledge Society are the open access to information, the freedom of expression and the linguistic diversity.

Therefore, the fields of study of our research are Education, Communication and Web 2.0 supporting tools. We considered that it was important to investigate these fields due to the importance that the Regional Administration was giving to the introduction of ICT, particularly the Web 2.0 tools, in education. The incorporation of Web 2.0 tools in teaching is having a great impact in education and the use of these tools is expected to increase according to the principles of the Media Education and School 2.0, which will be explained later in this summary.

In the Society of Information, a change in "what" we teach and "how" we teach is needed. This new Society forces us to rethink the role of teachers, students and taught subjects in education. Therefore, teachers should try to encourage collaborative works in the classroom, which can be supported by mechanisms such as the Web 2.0 tools.

To the best of our knowledge, there are no studies addressing the particular use of Web 2.0 resources in Spanish secondary education. Therefore, our research study covers the lack of information regarding two relevant points: The Media Education and School 2.0.

With respect to the Media Education, it is noteworthy that skills such as the ones related to the use of many languages, to critical thinking, and to the interaction with others in real and/or virtual modes, should be potentiated [1].

Concerning the Education 2.0, it is noteworthy that the advances occurred in education based on the communication model 2.0, .i.e., the Web 2.0, is based, inter alia, on the use of social networks. The active interactive joint of teachers and students is also closely related to collaborative learning and authorship for example blogs and wikis.

Education and Education 2.0 are related through the emergence of the communicative model 2.0 in which both teachers and students are active participants in the communicative act, that is, a continuous exchange of roles where both teachers and students can be authors or co-authors of the information and knowledge. According to Aparici et al. [1], the Web 2.0 has changed the rules of the game and allows Internet to contribute collaboratively in the construction of collective knowledge from individual acts of group communication that can occur in cyberspace and real space.

The receiver and the transmitter of the information are transformed into an EMIREC which sends and receives messages [2]. In this model, the role of the students substantially changes. As the learning focuses on the students, they should take an active role building the teaching-learning process. It is expected that the students are able to exercise autonomy, to develop critical thinking, to adopt collaborative attitudes and to use the theoretical knowledge to solve real problems This model of communication enhances the possibility that the students cast its own messages through different languages, strengthening the educational proposal of personalized education, as well as affective and emotional processes that occur in all educational relationship.

In addition, the digital literacy is a new concept that should be taken into account when considering the training of teachers in the Media School.

Literacy is the education that everyone needs to live in society. A new model of literacy is needed in the digital society: the digital literacy. Furthermore, this new literacy, defined as the basic capacity to understand and to express in different languages and meanings, is constructed collaboratively between teachers and students, as defined in [4]

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What we teach and the way we teach it should be changed. Therefore, the role of the teachers, students and contents in learning should be redefined.

Currently, we are part of a networked society, mainly due to the Internet, that has changed the processes, interests, values and social institutions in the way we knew them. Internet has propitiated new ways of relationship, that wouldn´t have been possible without the tis technological advance As indicated in [5], Internet is the heart of a new paradigm that currently constitutes the base of our lives and of our ways of relationship, work and communication. Internet processes the virtuality and transforms it into our reality, constituting the network society, which is the society where we live.

We cannot forget the importance of TIC in the school. As specified in [6], The implementation of TIC needs several capacities such as cooperation, capacity of initiative and dynamism in the working places, to be able to work in groups, interactive learning between the members of the group, communication, to be able to work with abstract concepts, to identify and solve problems, aptitude to make decisions, being able to seek and to use the information, predisposition for the permanent training and other.

The appearance of these technologies demands to train teachers, as most of them are not familiar with TIC resources and lack the necessary skills to use them.

The immense majority of the administrators, educational managers and teachers are digital immigrants. (...). These professionals rarely use the digital technologies and are very resistent to modify their conception of the world of the work based on the industrial models of ends of the 19th century [1].

III. METHODOLOGY

In the following, we describe the methodology conducted to perform our study. First of all, this is an observational study in which teachers from secondary schools in the region of Madrid have been electronically surveyed . No exclusion criteria were established.

Data Collection

To achieve the objectives of the study a questionnaire asking about different aspects, such as the professional profile, the opinion on the usefulness of Web 2.0 tools for teaching , the involvement of teachers in the use of Web 2.0 tools and their perception of student interest in the use of these tools, was designed (Figure 1).

Teachers from different schools of the Region of Madrid (both, public and private) were invited to fulfill the questionnaire. The questionnaire will consist of an HTML form heading to a PHP page which will register received data received into a MySQL database. Later, every data will be exported to the SPSS statistic package.

Statistical analysis

For the descriptive analysis of quantitative variables the mean was calculated. Qualitative variables were expressed as percentages. Comparisons between means were performed using Student's T test for independent samples. Qualitative variables were compared using the chi-square ($\chi 2$) test and the Fisher's exact test. Statistical significance was considered at $p < 0.05$ for the all the comparisons.

A binary logistic regression model was used to estimate the effect of the different variables on the use of Web 2.0 tools. All the variables which reached the statistical significance in the univariate analysis were included in the multivariate analysis. Thus, in the multivariate analysis, the dependent variable was the use of Web 2.0 tools.

The questions asked in the survey were selected considering the objetives of the study and their answers are coded. The data were analyzed with the statistical package SPSS. Questions 1, 2 and 3 aims to determine the most frequently used Web 2.0 tool, while questions 4, 5 and 6 are intended to characterize the use of Web 2.0 tools in the classroom. Finally, questions 7 and 8 will provide different information about the use of the tools. For example, whether they are being used, or not, for individual or teamwork purpose,

Number	Question
1	Are involved in the use of Web 2.0 tools in the classroom ?
2	Which are the Web 2.0 tools that you usually use? Why?
3	Do you think that the use of Web 2.0 tools in the classroom promotes the student learning ? Why?
4	Are students involved in the use of Web 2.0 tools? To work in group or to work individually?
5	Do you recommend the students to use Web 2.0 tools or do you think that they are not necessary for learning?
6	In what subject are you using Web 2.0 tools?
7	When do you use Web 2.0 tools? In group or in individual activities?
8	Do you use Web 2.0 tools in the classroom regularly or sporadically?

Figure 1: The questionnaire fulfilled by the teachers is shown above

IV. RESULTS

Eighty-one teachers have fulfilled the questionnaire so far. The main characteristics of the teachers included are summarized in table 1. Forty-one (51%) were male, 34

(42%) over 50 years and 19 (23,5%) with more than 30 years of experience. The majority of them were officials and 75% worked in public centers. Approximately half of them (54%) were teachers of Computing Science.

Although most of the surveyed teachers (86%) declared that the use of Web 2.0 tools reinforces and benefits the students' learning process, only 63% of them acknowledged using these tools frequently. In addition, only 33% of the teachers being using Web 2.0 tools manifested to use them during whole sessions in the classroom. When focusing on teachers that used the aforementioned tools, only 59% of them did it to work in group.

On the other hand, with respect to the interest shown by the students in the use of Web 2.0 in the classroom, the majority of teachers that used them (79%) considered that students are very enthusiastic about the use of these tools. A small proportion of teachers (6%) answered that the implication in the use of these tools varies widely and it depend on the characteristic of the student. In teachers' opinion, the students that used Web 2.0 tools seemed to do it for both individual and group tasks.

In the multivariate analysis, to be teacher of Computing Science was the only variable independently associated with the use of Web 2.0 tools in the classroom (odds ratio=7.9, confidence interval 95%=2.5-24.5).

Up to 20% of teachers consider that Web 2.0 tools are useful for teaching. However, the majority of them do not use these tools probably because they are not accustomed to these technologies, they have no training or because they do not have enough resources.

Only one third of the teachers that use the Web 2.0 tools do it throughout the whole class.

The majority of teachers that use Web 2.0 tools do it for working in group. This result should be underlined as suggests that teachers know the collaborative character of these tools.

Technological elements always seems atractive to the students (mainly at that age) and that should be use to introduce them in the classroom. Many teachers think that the use of these elements contribute to arouse interest of the students. In addition, these tools offer many facilities to promote and participate in group activities although obviously there are ways of interaction requiring presentiality such as debates, exhibitions, etc.

TABLE 1 RESUMES THE MAIN CHARACTERISTICS OF THE TEACHERS THAT FULFILLED THE QUESTIONNARIE.

Feature	Categories	% of participants
Gender	Male	40 (49%)
	Female	41 (51%)
Age	Over 50 years	34 (42%)
	Under 50 years	47 (58%)
Experience	Over 30 years	19 (23,5%)
	Under 30 years	72 (76,5%)
Type	Officials	55 (68%)
	Interins	26 (32%)
Centers	Public	61 (75%)
	Private	20 (25%)
Area	ICT	44 (54%)
	Non-ICT	37 (46%)

V. CONCLUSIONS

Our results suggested that although most teachers believe that the use of Web 2.0 tools promotes the students learning, only half of them use these tools for teaching and only one third acknowledge to be implementing actively the use of these tools in the classroom. In general, teachers think that the use of Web 2.0 tools in the classroom is well accepted by the students.

To teach Computing Science was the only factor independently associated with a greater use of these tools in the classroom (8-fold higher than among teachers in other specialties). The age of the teacher (older age) is associated with a lower use of Web 2.0 tools.

This study underscores the need for action to generalize the use of Web 2.0 tools in the classroom, with particular emphasis on the older teachers and among teachers from other specialties from Computing Sciences. Future studies should aim to identify the handicaps for the implementation of these tools in order to adopt strategies (procurement, training courses, etc.) to avoid them.

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