

# Usability Test for (Greek) Departments' Web Sites

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## Abstract

This paper examines functional aspects of the internet Web Sites that (re)present Greek Higher Educational Departments and Institutes and focuses on the promotion and dissemination of their educational and scientific results. The study conforms to the theoretical guidelines of a systemic approach that produces an overview of the consistencies and the asymmetries that define the impact of a Web Site as a communicative system. Web Sites representing Greek Higher Educational Departments and Institutes are evaluated as communicative systems that promote certain distinctions (that suggest meanings) in the context of the World Wide Web (WWW). The relevant evaluation includes five hundred and one (501) Web Sites and was based on eight (8) criteria. The results of this study hopefully will account for (Greek) Departments' Web Sites to be efficient, interactive and provide their readers with appropriate services.

**Keywords:** Evaluation, Usability, Web sites, University, Services, Greece.

## 1. Introduction

World Wide Web (WWW) has dominated almost every aspect of human activity. Reading the news, personal relationships, buying products and services and even education can be facilitated through the WWW. The internet owns its existence mainly in academic researchers that have combined their knowledge with imagination. We are currently in the second generation of the WWW, called Web 2.0, which is a term that describes the use of the WWW that has as a main goal to reinforce the production of content, the cooperation and the exchange of data between users. Web 2.0 includes various tools and services, namely social networks, wikis, blogs, multimedia sharing services, etc. The term was proposed in a conference organized by O'Reilly publishing company and Mediavive International in 2004 (O'Reilly, 2005). Web 2.0 has influenced and has, certainly, changed the way of communicating and providing information. This has also influenced the appearance of Web Sites of Higher Educational Institutes. The implications of Web 2.0 in the Higher and Further Education sectors were investigate by researchers (Anderson,

2007). Web 2.0 through the new possibilities that it provides makes easier for everyone to create a Web Site. For the services to improve initially, the weaknesses of the appearance of the Web Site should be found and corrected. For this reason, a lot of effort has been made in order to create a method that will measure and evaluate the function and the usability of a Web Site.

This paper focuses on usability issues interconnected with functional aspects of the Web Sites presenting academic Departments in the WWW. According to ISO 924 we can define usability as the extent to which a “product” can be used by specified users to achieve specific goals with effectiveness and efficiency, as such as the extent to which this product insures satisfaction of the users, in a specified context of use (International Organization for Standardization, 1998). In order to ensure that a product succeeds in meeting the users’ requirements it is crucial to assess the design procedures, by testing the results on the level of its use. This is the role of evaluation (Dix et al., 2004).

The rest of the paper is organized as follows. Section 2 presents a literature review of the subject under study. Next section 3 includes a description of the study. Methodological issues are discussed in the following section. Section 5 presents the findings and section 6 discusses these findings. Conclusions and future extension of this work can be found in the last section.

## **2. Literature Review**

A systematic discussion about the extent that a Web Site allows users to feel comfortable and satisfied by the services provided to them was introduced in 1999 by Chen and Wells (Chen & Wells, 1999). The same year Luis Olsina, proposed a quantitative evaluation approach to assess the quality of six typical academic Web Sites, called thereafter Quality Evaluation Method (QEM) (Olsina, Godoy & Lafuente, 1999). In 2001 Luis Olsina outlined more than a hundred characteristics and attributes for the domains of the academic Web Sites (Olsina, Lafuente & Rossi, 2001). In 2008 Kasli and Avcikurt (2008) evaluated the academic Web pages of the University Departments of Tourism in Turkey, using 45 questions (Kasli & Avcikurt, 2008). Finally, Volker Thoma and Elliott P. White presented their work about rationality and intuition in usability evaluations. Usability ratings of a certain University Web Site were analyzed by 60 students and the results were compared with the participant’s self-ratings of their cognitive style (Thoma & White, 2011). The selected studies presented above confirm the general interest about the perspectives and the problems arousing from the establishment of the Web Sites as “organic” parts of the public image of the Higher Educational Institutes and they indicate some of the approaches applied in the relevant issues.

## **3. Study Description**

This paper addresses the quality of the Web Sites representing the Greek Universities (Higher Educational Institutes) and the Greek Technical Universities (Higher Educational Technical Institutes). The relevant research process concluded in the formation of a questionnaire consisting of eight criteria. The questionnaire was put in test using descriptive statistics as quantitative analysis, for an evaluation of the services provided for the users. The results had to do with: i) accessibility and visibility: The existence of two official Web Sites online, Provision for People with Disabilities, ii) Authority/Privacy/Security: Existence of favicon.ico (logo), Co-existence of favicon.ico with the Department's logo, Official title of the Department presented in a Web Site, iii) Interactivity and Services: Web Site version for portable devices, Connection of the Department's Web Site with social networks (e.g. Facebook, Twitter) and Connection of the Department's Web Site with a free-of-charge Web service (e.g. YouTube, Picassa, etc.).

These criteria were used as analytical categories which lead to a critical retrospection of the presentational forms of the Greek Universities and the Greek Technological Universities in the WWW. Furthermore, this research led to the finding of potential problems and weaknesses of the Web Sites, so to conclude in certain recommendations for possible improvements. Furthermore, (re)presentations introduce and (in)form (about) the public image of the Educational Institutes in the digital era, as they delineate communicative schemata about the Educational Institutes under circumspection, transformed and interpreted as conceptual schemata by the users. As a result, the communicative aspects of the Web Sites (re)presenting Educational Institutes in the WWW emerge as crucial parameters in the process of the evaluation of these Institutes by the users. Thus, the main question refers to the nature of the communicative relationships interconnecting "independent" informational parts in a multi-dimensional entity, producing "holistic" images about the Educational Institutes under scope. The answer may lie in a systemic approach of the Web Sites (re)presenting Educational Institutes in the WWW, as communicative systems. To support such an option we have to examine the characteristics of the Web Sites (re)presenting Educational Institutes in the WWW from the point of view of the autopoiesis of such a system, i.e. how independent sub-entities are interconnected in a general communicative schema, which at the same time is able to reproduce itself (as a communicative schema). The basis of such an approach is the meaning attributed by the external observers to the operational ontology of such a communicative schema, i.e. how the users interpret (re)presentational forms of the Educational Institutes under focus by the conceptual schemata imposed onto them according to certain analytical categories, like those described above.

The main value of the analytical categories and the relevant statistical results evaluating different degrees of adjustment in contemporary (2011) international prototypes defined above, can be estimated as qualitative rather than quantitative data (or as quantitative data interpreted also as qualitative data) in the context of a

systemic approach. Such an approach could unfold and enrich the dilemmas interconnected with the (re)presentational forms of Educational Institutes in the WWW, towards a descriptive analysis which will enclose and purchase systemic consistencies as means for interpretation. By this, interpretation emerges as the basic analytical category of interesting, measuring the qualities of the data presented here; in this context interpretation is not considered as an abstract theoretical thesis, but as an applied tool which marks out interconnection with the autopoiesis of the system under observation: meaning comes back as an unexpected visitor to point out the limits of the autopoiesis of the communicative system defining Educational Institutes in the WWW· under these circumstances meaning is identified by hermeneutics in interrelation with the accomplishment of certain criteria of (re)presentation. The last emerge as a key parameter for the autopoiesis of the communicative systems defining Educational Institutes in the WWW· they determine noematic transactions between the developers of the Web Sites representing Educational Institutes and the users that exploit services and highlight the perspectives of these Web Sites.

#### **4. Methodological Issues**

The research sample includes all the Web Sites presenting the Greek University and Greek Technical University Departments which offer -at least-undergraduate courses, according to the Greek official list of 2010. It is worth noting that Web Sites built (especially) to support postgraduate programs are not included in the research sample. The research was contacted from June to July of 2011.

The research data include the title of each Department, the official address of the Web Site (re)presenting the Department, date and time of access, as well as screen shots from the Web Site. The research process was organized as a four-step procedure: a) the Web Sites of 501 University Departments were recorded and cross-examined, b) there was a first visit into the relevant Web Sites and the upcoming results were recorded, c) a few hours after the first visit, a second visit was conducted and defined the final results to each question, and d) finally, descriptive statistics and quantitative analysis formed the relevant conclusions. Of course we have to keep in mind that due to the dynamics of the internet, some information or parameters registered will probably have changed by now.

Some useful remarks are the following: a) for the question referring to the possible existence of two official versions of a Departmental Site in the WWW, a search was conducted by search engines and if results were produced, the addresses were recorded, b) the logos of the Universities in which each Department belongs, were considered acceptable as replacements of the logos of specific Departments -if the last didn't exist- in the favicon.ico application, and moreover it was additionally tested whether next to favicon.ico in the main page of the Departments under scope (in Greek version), there was the official title of the Department according to the Greek

Educational Ministry's official list of 2010, c) in case that a Web Site allocated a sign that marked that was friendly for People with Disabilities, it was tested if this sign was issued by the international organism W3C, or if it was stated because there was a version of the Web Site friendly for this group of users, d) when a link, a banner or some connection in the Web Site did not appear, then the answer in the results was negative: if the basic criteria were not satisfied, the applications presented on the Web page were treated (and estimated) as if they did not exist, and e) the browser that was employed in order to access the Web Sites was Mozilla Firefox; the 501 links of the Web Sites presenting Greek Higher Educational Institutes were saved in a Data Base that was created for the needs of the research.

## **5. Findings**

### ***5.1 The existence of two official Web Sites online***

WWW has been further developed during the last years, in interconnection with the fast evolution of new technologies. It is reasonable therefore, that most of the Web Sites are created from scratch, so that they comply with the standards of the new communicative era. In this context, new Web pages are created, while some of the old ones are maintained. These old versions misinform the users by offering non-updated information. So this question investigates how many Departments maintain such Web Sites, which provide information that have been altered through time from the old to the newest version of the Web site of the Department.

The results indicate that 8 percent of the Greek academic Departments maintain at least two official Web Sites that are accessible by users on the World Wide Web, when 91 percent of the Departments have one active Web Site. Also 1 percent of the Departments do not support any active Web Site.

### ***5.2 Provision for People with Disabilities***

People with Disabilities and their needs for accessibility should not be ignored. Paragraphs 1 and 2 of the Article 5A of the Greek Constitution define that: “1. All persons have the right to information, as specified by law” and “2. All persons have the right to participate in the Information Society. Facilitation of access to electronically transmitted information, as well as of the production, exchange and diffusion thereof, constitutes an obligation of the State,...” (Hellenic parliament, 2008). So, the Web Sites presenting the Departments should bear signs that, as it was mentioned before, suggest that they are user-friendly for people with disabilities. In the study we have included only those Web Sites that are of level AA and AAA, but also the Web Sites that mention that they have another version for People with Disabilities (The World Wide Web Consortium (W3C), 2012), (The World Wide Web Consortium (W3C), 1999), (The World Wide Web Consortium (W3C), 2008),

(The World Wide Web Consortium (W3C), 2012), (The World Wide Web Consortium (W3C), 2013).

In the question whether the Web Sites of the Departments include logos stating that they are friendly for People with Disabilities the results are as follows: 1 percent of the Web Sites presenting Departments of Higher Education in Greece have signs that they are accessible for People with Disabilities, while 96 percent of the Departments do not offer such a service. There are also 3 percent of the Departments that either do not have a Web Site or their Web Site is under construction or their Web Site is not functional, so the question can not be answered.

### ***5.3 Existence of favicon.ico (logo)***

When a visitor types an address on his/her browser, next to this address appears an icon. This icon will either be the preselected icon of the browser or a different icon called favicon.ico, an image file that is appointed by the owner of the Web Site and bears his logo. The favicon.ico should be an image or animated image that gives off a sense of movement. The icon should have dimensions of  $16 \times 16$  pixels or  $32 \times 32$  pixels. This way, the visitors recognize that they enter the official page of the Web Site that they have searched for. There have been two studies that indicate the importance of the existence of a favicon.ico. The first one is a study on detection techniques of bookmarking (Favorites) using favicon.ico in the web browser (Choi et al., 2004). The second focused on the detection of phishing attacks (i.e. online fraud attacks that seek to retrieve the credentials of registered users of a protected domain) with the use of favicon (Unlu & Bicakci, 2010). This is a Firefox add-on that watches over the open tabs and indicates whether one of them has changed its layout, favicon and/or title, in order to be misled for another site.

In the question if there is a favicon.ico appearing in the address line of the browser: 56 percent of the Web Sites of the Departments have a favicon.ico on the address line of the browser, while 41 percent of the Web Sites presenting Departments have a blank favicon.ico preselected and no logo is introduced. There is also a 3 percent of the Departments that either do not have a Web Site or their Web Site is under construction or their Web Site is not functional, so the question can not be answered.

### ***5.4 Co-existence of favicon.ico with the Department's logo***

If there is other favicon.ico that appears instead of the one of the Department or the University in which the Department belongs to, the Web Site is providing wrong information, or the Web page was not modified correctly from the prefixed template that was used. There is also the possibility of a malicious intervention that misleads the users to think that they have entered in an official Web Site when in fact they have not (Unlu & Bicakci, 2010).



**Figure 1.** Example of a Department's site that has a (favicon) logo and that uses a (favicon) logo not relative with the Department or the University.

In the question if there is a favicon.ico that appears in the address line of the browser and has the logo of the Department under presentation: 50 percent of the Departments that have a logo on their favicon.ico present their own logo or that of the Institution (University) in which they belong. The rest 47 percent of the Departments include an irrelevant logo. There are also a 3 percent of the Departments that either do not have a Web Site or their Web Site is under construction or it is not functional, so the question can not be answered.

### **5.5 Official title of the Department presented in a Web Site**

If there has been a reference to the favicon.ico and its location on the Web Site, next to this icon there is the headline of the Web Site representing a Department by an official title that has been recognized by the Ministry of Education. As we know, the search engines recognize the content of a Web page, so it is crucial that the title at the front page defines the name of the Department under presentation, so that it guarantees that the appearance of the Web page in the search engines would provide quicker and easier access for the visitors (Xiaoyan & Jian, 2011). Also, when a user enters a site and does not see its official title, he can understand that this might be a “phishing attack” and thus he can take the appropriate actions (Unlu & Bicakci, 2010).

In the question if the title of a Department appears on the address line of the browser, the results are the following: 71 percent of the Web Sites of the Departments introduce their official titles on the address line of the browser, when 26 percent do not present them at all or have a wrong title. There is also a 3 percent of the Departments that either do not support a Web Site or their Web Site is under construction or their Web Site is not functional, so the question can not be answered.

### **5.6 Web Site version for portable devices**

According to a study conducted by The Observatory for the Greek Information Society in 2011 (The Observatory for the Greek Information Society, 2011), 95 percent of the citizens of Greece aged between 16-74 use mobile phones. 24.6 percent of those have a permanent internet access (3G) through their smart phone. It is therefore expected that the Web Sites presenting an academic Department should include a version appropriate for portable devices. The use of portable, wireless and handheld devices is gradually increasing in every education sector as we can see in the research of Shun Rebekah Han Wong (Wong, 2012).

In the question if there is a version for portable devices of the Web Sites presenting the Departments and whether this it is mentioned in the front page of the Site under scope: 1 percent of the Web Sites of the Departments offer mobile versions of their Sites for their visitors, while 96 percent do not support such versions. There is also a 3 percent of the Departments that either do not have a Web Site or their Web Site is under construction or their Web Site is not functional, so the question can not be answered.

### ***5.7 Connection of the Department's Web Site with social networks***

Social networks form digital communities and offer internet users the ability to create profiles and develop a network of contacts. According to a study conducted by The Observatory for the Greek Information Society, the increase in the use of social networks in Greece shows unprecedented pace; from 2008 to 2010 there is an increase of 1550 percent in the use of social networks (The Observatory for the Greek Information Society, 2011). The phenomenon of the social networks and how they have affected the society is an issue under investigation (Choudhury & Sundaram, 2011), (De Vries, Gensler & Leeflang, 2012), (Mislove et al., 2007), (Musial & Kazienk, 2012)]. Some Departments have realized the communicative importance of social networks and have already been connected to them through their Web Sites.

In the question if there is an icon in a Department's Web Site indicating a connection with a social network (e.g. Facebook, Twitter), the results were the following: 6 percent of the Web Sites of the Departments of Higher Education have a connection with social networks, while 91 percent of them do not have such a connection. There is also 3 percent of the Departments that either do not have a Web Site or their Web Site is under construction or their Web Site is not functional, so the question can not be answered.

### ***5.8 Connection of the Department's Web Site with a free-of-charge Web service***

Any Department can take advantage of free services like those offered by YouTube, and employ it in order to disseminate its information. Some of the Departments might not possess the technical knowledge or the human resources in order to support such services on their own, so they can use similar free-of-charge Web services. By utilizing those free services, the Departments can achieve better communication within the WWW community, as well as distribute and share academic knowledge worldwide (Choudhury & Sundaram, 2011), (Colburn & Haines, 2012), (De Vries, Gensler & Leeflang, 2012), (Mislove et al., 2007), (Musial & Kazienk, 2012), (Topps, Helmer & Ellaway, 2012).

In the question if there is a connection of a Department's Web Site with a free-of-charge web service (e.g. YouTube, Picassa, etc.) the results were the following: 3 percent of the Web Sites of the Departments of Higher Education provide a connection with a free-of-charge Web service (e.g. YouTube, Picassa, etc) in their Web Site, while 94 percent of the Departments do not have such a connection. There is also 3 percent of the Departments that either do not have a Web Site or their Web Site is under construction or their Web Site is not functional, so the question can not be answered.

## **6. Discussion**

The rapid changes in the field of education impose certain requirements for the development of the Web Sites of academic Departments; certain corrections referring to the above analyzed criteria, such as, Accessibility and Visibility, Authority/Privacy/Security, Interactivity and Services, Search Ability, can be proved crucial for a new systemic communicative order defining the Greek Higher Educational Institutes in the context of WWW.

Based on the results presented above we can summarize and discuss the findings as follows: First of all, it seems that an overwhelming number (97 percent) of the Departments of the Greek Higher Educational Institutes are represented by Web Sites in the WWW, when discrepancies boosted by the existence of an older edition (8 percent) of the Web Sites representing some of the Departments are more or less limited. That means that Greek universities understand the value of good web presence although the concurrent existence of an older version may confuse users who are interested in obtaining information about a university Department. The Departments that have two (2) official Web Sites online, have to deactivate the old version in order to provide more accurate information to their users and to avoid causing confusion. Secondly, there is a massive absence of accessibility services addressed to People with Disabilities. Universities are obligated to share the knowledge even in the WWW, without any discriminations. Only 1 percent of Greek Departments offer easy access to their Web Sites for people with disabilities. In such a way, active members of the University but also other potential users with

disabilities are disclosed from the information that the Web Site provides. That results in an inability to obtain knowledge and in general to access educational resources. This situation has to improve considerably as soon as possible in order for all the users to have access in this certain category of Web Sites without any exceptions.

As far as users of mobile devices are concerned, the results are also very disappointing (only 1 percent of the sample offer mobile editions). This finding is contradictory with the society's opposition of discrimination practices and reveals a negative attitude of University Departments towards this matter. Also it is quite strange for Universities, that their main audience is young people, not to utilize portable versions of their Web Sites, taking into account the high percentage of use of mobile devices among young people (The Observatory for the Greek Information Society, 2011).

Third, we recorded a rather negative balance in Web Site use of favicon.ico. Almost half the Universities (47 percent) were found to incorporate favicon.ico that were from another organizations or companies (Figure 1). The use of suitable favicon.ico can help Universities avoid cyber attacks (Choi et al., 2004), (Unlu & Bicakci, 2010). Overall, it would be preferable if the Departments had their own logo, which could be used in all their activities so it could be widely recognizable. In this way, the Departments will differ and will demonstrate the appropriate credibility.

Fourth, it was found that 26 percent of the sample employ a different title from the one officially recognized by the Greek Ministry of Education. If Departments' Web Sites do not use their official titles, users may not recognize them, or feel reluctant concerning the validity of the information they offer. In addition, this may create difficulties in finding the Department's Web Site with the help of search engines but also in its distinction from other similar Departments.

Fifth, the results showed that a very small percentage (6 percent) of the Web Sites presenting academic Departments and Institutions are connected with social networks , despite the fact that the use of social networks has increased significantly (The Observatory for the Greek Information Society, 2011). The use of social networks can help in disseminating information and knowledge that each Department provides to its students and to other interested parties. The students can express their opinion about potential service improvements and can provide suggestions about the Web services that the Departments provide.

Finally, it was observed that, the percentage of the Web Sites presenting Departments which are connected with free-of-charge Web services (e.g. YouTube, Picassa, etc.), that permit the upload of audiovisual material or notes of the lessons, was remarkably low (3 percent). This lack of free-of-charge Web services use is not generally counter-balanced by other services provided by applications developed by the Departments under scope. The use of such services can give students the ability to have access to course material remotely, without any cost.

To sum up, the University Departments and more specifically their Web Sites should follow the developments of the WWW. In this way, they could provide a more effective digital presentation. Also, they could help the users in order for them to be satisfied by the services that they provide. What is more, they will reinforce their status in the eyes of the visitors and to the academic community through a successful Web presence.

## ***7. Conclusions and Future Extensions***

From the results of the study it is obvious that Greek university's Web Sites utilize an inadequate web presence. Despite some asymmetries resulting from the existence of older versions of the Web Sites representing some of the Departments, or the relative low number of services interconnected with favicon.ico and search engines for the information included into the Web pages of the Departments, the results seem to confirm initially the existence of communicative systems capable of facilitating the autopoiesis (Luhmann, 1986), (Humberto & Varela, 1980) -at least for the vast majority- of the (re)presented Departments. But these systems are -more or less- characterized by low complexity and thus lack of proliferation of upcoming communicative results.

Furthermore, these systems fail -more or less- to meet the additional requirements of the contemporary WWW users, as they are not competitive with respect to the services provided to the users. Under these terms, the discussion of the results creates (probably) more questions than answers: are these sub-marginal communicative systems representing Greek Higher Educational Departments and Institutes recognizable as such in the context of the WWW? The answer may lie again on functionality: as far as those systems still function on communicative topics, they can be recognized as functional in terms of evaluation. On the other hand, as far as those communicative systems do not introduce innovative adjustments following contemporary requirements, the meaning they emit to (potential) users will fade and will become eventually less powerful. Put on; epochal revisions of the Web Sites representing Greek Higher Educational Departments and Institutes can improve the odds: the ability of the (re)presentational forms of the Greek Higher Educational Departments and Institutes to adjust and establish themselves as communicative systems depends on certain improvements which define their autopoiesis.

Future extension of this work will include a comparative study with foreign universities is considered to be essential for the evaluation of the Web Sites of Greek Higher Educational Institutes.

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### **Περίληψη**

Η παρούσα έρευνα εστιάζει σε παραμέτρους ευχρηστίας που αφορούν το περιεχόμενο και τις υπηρεσίες που παρέχουν οι διαδικτυακοί τόποι των τμημάτων της Τριτοβάθμιας εκπαίδευσης στην Ελλάδα. Τα αποτελέσματα της αξιολόγησης βασίζονται σε οχτώ (8) κριτήρια που ερευνήθηκαν σε όλα τα ΑΕΙ και ΤΕΙ της χώρας. Τα αποτελέσματα αυτής της μελέτης ευλπιστούμε να συντελέσουν ώστε οι διαδικτυακοί τόποι των τμημάτων της Τριτοβάθμιας εκπαίδευσης να είναι πιο αποτελεσματικοί, αλληλεπιδραστικοί και να παρέχουν στους επισκέπτες τους τις απαραίτητες υπηρεσίες ώστε να επιτυγχάνουν το σκοπό για τον οποίο δημιουργήθηκαν.

**Λέξεις κλειδιά:** Αξιολόγηση, Ευχρηστία, Διαδικτυακοί τόποι, Τριτοβάθμια εκπαίδευση, Υπηρεσίες, Ελλάδα.