MOBILE WEB 2.0: DESIGN AND DEVELOPMENT OF EDUCATIONAL WEB CONTENT FOR MOBILE PHONES

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Abstract: The mobile phone is no longer just a device that is limited simply to call or send and receive text messages, as with earlier models of this century. A decade later, has become a true media center with an increasing storage capacity, program implementers, network connections, TV, GPS geolocation, etc. We are presenting a research paper about designing web pages for mobile phones in an educational context. In the theoretical framework, we will study the current situation of mobile telephony as an educational resource. Then we will establish a framework of methodological approach based on the tools of the Web 2.0, finally arriving to the creation of mobile Web “Design of Web Pages in Educational Contexts” as part of the doctoral program at UNED MODELTIC.

Keywords: Mobile phone and education, mobile learning, Web 2.0, Web Design.

I. THEORETICAL FRAMEWORK

The use of mobile electronic devices in the educational field, as well as their presence in classrooms, is relatively recent and has given way to a new educational paradigm: mobile learning. Mobile devices include: MP3s, PDAs, smartphones, iPods, Netbooks, Tablet Pcs and mobile phones. The use of such devices within the learning field is what we call mobile learning.

This learning method is remarkable for its ubiquity, as these devices offer the possibility to learn at any given moment and place. Besides they favour collaborative learning and educational communication in a synchronous or asynchronous way, and they enable student-centred learning, enriching the learning experience through multimedia elements, among other advantages [5].

1.1 Towards a didactic model for mobile devices: microlearning

Microlearning can be defined as the (usually brief) interaction with microcontents [7]. Microcontents are small, self-contained information units which, when aggregated, can make up larger units [8]. For instance, when we read an e-mail or a forum comment, when we search for information on a search engine, download a podcast or receive SMS, we are accessing microcontents. The spread of mobile devices has boosted this learning method through microcontents in the educational field.

But these devices have a set of technical features such as: screen size, memory, etc., which considerably condition the design and distribution of learning contents. From a didactical point of view, it is advised to divide learning contents into small, brief segments, distributed in regular time intervals [2] [6].

Therefore, in the microlearning didactic system we should build educational micro-units suitable for their presentation in various formats (individual or multimedia) such as audio, video, pictures, text... which could, in turn, be divided into micro-activities to be programmed within short periods during the day, according to the student’s available and advisable learning time. These microlearning sessions could lead, in turn, to a more global learning process.

So, we will need: an easily transportable device with enough technical and multimedia capacity; didactical material adapted to the characteristics of such device and finally, a learning pace
that spares contents in short and regular time intervals. Without a doubt, mobile phones can comply with these requirements.

1.2 Mobile Phones and the Internet: Mobile Web 2.0

What is Mobile Web 2.0? It is the best of two worlds coming together: the Web 2.0 and mobile phones [11]. Mobile Web 2.0 has evolved from Mobile Learning and Web 2.0 through the adaptation of Web 2.0 to mobile technologies [4]. Mobile Web 2.0 enables the access to several Web 2.0 resources adapted to the features of mobile devices, such as moblogs (blogs for mobiles), mowikis (wikis for mobiles), podcast, mashups, m-Voip (phone service with Voip technology for mobiles), social networks, etc.

Until now, we had witnessed the attempt to adapt WAP technology to mobile phones. But Internet navigation with this system proved to be uncomfortable for users (and still is for most mobile phones) due to operability, incompatibility, accessibility and usability reasons such as: slow navigation, websites which looked nothing like the websites normally viewed on a conventional computer, uncomfortable navigation through websites, screens not big enough for the correct viewing of websites, uncomfortable entering of data due to mobile mini-keyboards usable only with one hand, expensive connection rates, the absence of a navigation system by windows (enabling the viewing of one page at a time in a linear sequence), among other reasons [1].

However, we are facing a moment when a second chance is given for the development of the Mobile Web. The telecommunication companies have launched attractive flat rates for mobile phones; new phones have been launched which make navigation much easier thanks to their tactile screens; website viewing on mobile phones is more and more similar to their viewing on portable or desktop computers. The extension of WiFi networks to 3G phones enable Internet access from virtually anywhere; there are Web 2.0 tools which make it much easier to create blogs and webs for mobile phones and--most important--we can now access such popular services as e-mail accounts, chat and instant messaging programs, and the number one service on the Internet: social networks. In fact, it was the social network websites the ones to develop the best webs adapted to mobile phones. And these are some of the reasons as to why mobile Internet access has trebled in the course of just one year (Durán 2009).

1.3 Mobile Phones and the Internet: Mobile Web 2.0

It is not the same to design a website for a desk computer than one for a mobile phone. The most obvious—and crucial—difference is the screen size, which will determine the design and contents to be applied. So, to this effect, we must resort to the simplicity which enables a fast loading and avoids the saturation of elements by searching for coessential selection.

Web 2.0 provides many and various tools for the design of mobile webs in a simple, quick and cost-free way. And all of this is very important within educational contexts: a day will come (and it will be soon) when the building of moblogs, webquest, mWikis or mobile websites will be a part of the daily learning activities to be performed for or with our students. From the several options provided by the Net, we have chosen UBIK (www.ubik.com).

On the other hand, It is not necessary to connect to the Net through a mobile device in order to test web pages, as we have the option of online emulators. We will use http://mtld.mobi/emulator.php (Figure 1), for mid-range phones and http://iphonetester.com, the emulator for the new iPhone (Figure 2).
II. RESEARCH WORK OBJECTIVES

Through this theoretical-practical work we intend to:

- Establish a theoretical basis on the subject of mobile phones in education.
- Explore the Web 2.0 tools for the creation of mobile educative web pages.
- Propose a methodological guide for mobile design with educational purposes.
- Create the website: Design of Web Pages in Educational Contexts.

III. METHODOLOGY: DESIGNING THE WEBSITE HTTP://DPWCE.UBIK.NET

On a practical approach, we decided to design and create a particular website for mobile phones based on the “Didactic guide on the course of Design of Web Pages in Educational Contexts” [3]. It is both an informative and didactic website. Following Marqués [9] [10], we built the website according to the correct scheme.

3.1 Main goal

Our main goal is to design a particular but not exclusive website for mobile phones on the didactic guide of the subject “Design of Web Pages in Educational Contexts” (DWPEC) of the Didactics Department of UNED.

3.2 Methodology

For its creation we resorted to a Web 2.0 tool for the online creation of mobile web pages, accessible at www.ubik.net (Figure 3).
3.3 Activities

As this is an informative page, blogs are not contemplated. However, the design program offers the possibility for user interaction through the creation of a moblog (blog for mobile devices).

3.4 Technical and functional aspects

Our basic premise is simplicity. Technical aspects such as visual environment, navigation or interaction should be as simple as possible in order to enable a fast connection and good usability of the mobile website.

3.5 Contents

As regards contents, we endeavoured to follow those present on the didactic guide of the subject “Design of Web Pages in Educational Contexts” (DWPEC), but in some cases they had to be reduced in order to avoid screen saturation. A legible font was used in a colour contrasting with the screen background. The bold format was used only for titles and the underlining for external links. Likewise, three font sizes were used in order to divide contents by level. Each page includes the authors of the didactic guide, as well as a contact page.

3.6 Navigation

We will produce a fixed menu at the bottom section containing the website’s structure in a permanent way, in order to make access easier. Navigation levels will be avoided. Also, maximum use of keyboard is avoided and only the necessary external links are used.

3.7 Visual environment

The main colours are green and white, the ones in the UNED logo. This design enables the correct viewing of contents. No multimedia elements were used, and graphics and pictures were
3.8 Interactions

The only interaction elements are: a search engine on the first page and some external web links.

3.9 Standards and web files

As this website is created and stored online by a Web 2.0 service, we should not worry about having to manage or allocate any kind of web files. Besides, www.ubik.net respects the unique web principles and creates a web page which is valid and viewable through any device type, such as a desktop computer or a PDA. It was also tested at http://ready.mobi, and it complies with all the web standards recommended by WC3.

3.10 Pedagogical aspects

The mobile web page we created has an informative aim. Contents, as well as their extension and organization are adapted to suit this purpose and their addressees, as well as the goals we intend to reach. To this effect, both navigation and visual environment favour the access to information and its correct understanding, avoiding the overload of elements and the presence of superfluous elements. Interactions are appropriate for the website type, enabling the search for information and the contact with teachers.

3.11 Website structure

The website follows the structure of the course Design of Web Pages in Educational Contexts, but adapted to a mobile environment. It is divided into:

• Presentation;
• Introduction;
• Course objectives and topic outline;
• Course methodology and visualization;
• Activities and practices;
• Timing;
• Resources;
• Assessment and final report;
• Contact us.

The final version can be viewed at http://dpwce.ubik.net (Figure 4)

Figure 4. The website DWpEc
IV. CONCLUSIONS

The world is “becoming mobile” and, consequently, the new generations are becoming interactive. In the educational field we must endeavour to integrate and normalize these potential educative tools, avoiding their exclusion, as they will considerably broaden the learning contexts towards a full space-time ubiquity.

Therefore, convinced as we are of the great potential offered by mobile phones to act as educative tools, we wanted not only to offer a theoretical frame but also a practical approach to be applied in our daily work. Being aware of the fast spread of mobile Internet and within the frame of the activities and practices of this subject, namely, Design of web pages in educational contexts (DWpEc), we decided to make our contribution by showing the educative uses of mobile phones, proposing the design and creation of a particular website for this means of communication as a central task for the work on said subject.

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