



Maintaining a sustainable Future for IT in Higher Education

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iUOC: Enhanced Mobile Learning at the UOC

ABSTRACT

iUOC: Enhanced Mobile Learning at the UOC is an initiative of the Universitat Oberta de Catalunya (UOC) in collaboration with mobile operator Orange Spain, that aims to take the UOC's virtual campus, My UOC, to new, more current, interactive and portable scenarios, such as the iPad. The Apple tablet is a userfriendly, intuitive and ultra-portable tool with Internet connectivity, which means it has great potential for the field of learning, where much experimenting is being done. Against this promising backdrop, UOC and Orange have undertaken a pioneering initiative in the design of portable learning environments in developing a native application for the iPad, thanks to which the MyUOC virtual campus can now find its way onto your screen. iUOC also guarantees the real-world adaptation of its learning application via a pilot programme in which iPads with 3G connections are provided to 45 students and lecturers for accessing, via the native application, the virtual campus and the UOC's educational materials (adapted for the iPad) for a semester. Basically, iUOC aspires to enrich the learning experience making use of the versatility and portability of the new mobile devices, using RSS technology to provide a connection to the communication spaces of students and lecturers in the virtual campus and facilitating access to materials adapted for these environments and platforms.

1. INTRODUCTION

The Universitat Oberta de Catalunya is a distance university in Catalonia, Spain. It has more than fifty thousand students and two thousand teachers who teach and learn through a virtual learning environment (VLE). This VLE has virtual classrooms with different collaborative skills and applications in order to do the courses.

The Universitat Oberta de Catalunya's mission is to guarantee access to university education for the entire population. In this context, the profusion of mobile devices and their deep penetration worldwide demands that institutions provide their content and give students the option to undertake their education using virtual learning environments adapted to these devices and conceptualised for these new portability scenarios. This is because we have learning contents in different digital formats other than printed paper, as web, pdf, audiobooks, videobooks, daisy format for blind people and even specific formats of electronic ink, as epub and mobipocket. iUOC is a key initiative for the UOC in this sense, providing access not only to the contents, but also to the communications spaces of its VLE, in such a portable and interactive device like iPad.

On the other hand, the UOC is the Catalan university with the most students with disabilities. This is because one of the priorities of this project is to increase the portability of the learning processes without compromising accessibility and improving it as much as possible. In other words, education must be able to be undertaken in portable scenarios as well as being accessible to everyone. The star device of this trial, the iPad, was chosen not only for its high level of interactivity and portability, but also for its accessibility functionality, which makes it easier to use for people with visual and hearing impairments and those with physical and learning disabilities. This functionality includes a screen reader, automatic subtitling of videos and podcasts, and more than 30 international Braille tables. This way, and via the inclusion of the iUOC application in the Apple Store once the pilot stage is passed, it will be possible to provide service to any student or lecturer via their iPad, regardless of their functional and cognitive characteristics. Lastly, it is also important to note that iUOC provides access to the teaching content in different formats adapted for the device, such as ePub, audio and VideoBook, thus guaranteeing the accessibility of these resources.

2. STATE OF THE ART

The starting point for the iUOC project in its very conceptualization is the research into mobile learning in commuting contexts, which also makes it a laboratory for assessing experiences with mobile learning. In previous research (Gil-Rodríguez & Rebaque-Rivas, 2010), we find that the potential of m-learning for on-line education is evident in these paradigmatic mobile contexts, since students plan their studies taking into account all the moments and places where they can possibly study (including mobile scenarios). In this sense, the Internet connection is also a basic element for students while they commute: they can consult learning contents and spaces of communication in their virtual learning environment and they want to spend their travelling time doing this.

On the other hand, in recent years, the market has been swamped with devices with Internet connectivity offering very differing functionality and, therefore, different means of use. Mobiles, laptops, smart diaries, tablets and televisions are a few examples of devices for which connectivity is the only common aspect. In relation to this, the e-learning community has focussed its efforts on exploring the potential of mobiles and their applications. There is, however, a slight risk that the on-line learning processes may appear out of date to users if efforts are not united to (a) create multi-device virtual environments and (b) design multifaceted courses, i.e., courses with different facets, each of which is a sum of the educational content and applications for a given type of device. In fact,

despite the amount of research, innovation and applied projects¹ related to iPads in education (Melhuish & Falloon, 2010; Crescente & Lee 2011), we haven't found any native application to enable an integrated access to VLE's as iUOC.

At the moment, iUOC pilot programme is the only project (or no similar initiative has been found up until now at least) that defines the characteristics of a virtual learning environment adapted to the characteristics of the iPad, and also tests it out in a real-world learning environment. Therefore, the conclusions of the study may be of great use to other institutions devoted to education.

3. TECHNOLOGY: WHAT'S I-UOC?

In order to address these students' needs of mobility, the UOC, in collaboration with mobile phone operator Orange Spain, developed a native application for the iPad from a user-centred perspective, guaranteeing a minimum learning curve for the application as it is intuitive and easy to use for both students and lecturers. *Students participating in iUOC have the ability to check their mail, diary, educational materials, classrooms and the opinions of other students literally in their hands.* They, therefore, enjoy a high degree of accessibility and total autonomy in managing their time.

iUOC aims to reach students that need more personalized and flexible learning processes. Thus, iUOC makes mobile learning a reality by providing access via Wi-Fi and 3G networks any time and anywhere to both the student's virtual learning environment and teaching content. In addition, *iUOC establishes the technology bases for the adaptation of its virtual learning environment, MyUOC, for any mobile device via Web browser or native applications thanks to RSS technology.*

The key technology for the application, which supports communication between the iPad client and the UOC server, is RSS, a standard technology that allows the syndication of data from different sources for freely exploiting it. iUOC is supported by the MyUOC's container of widgets for obtaining data. So, any widget supported by MyUOC can be included in iUOC. In this way we can share data, content or services seamlessly with other applications from other vendors at minimal cost. iUOC supports the straightforward and scalable sharing of the data of the virtual learning environment with other native applications for the different platforms of the desktop Web. While the application is initially for the iPad, the project has defined a data model that can be used in any application for any device with an Internet connection. In this way, iUOC defines bases for standards for adapting virtual learning environments for mobile devices.

¹ You can visit <http://www.apple.com/education/ipad/> and <http://www.apple.com/ipad/from-the-appstore/education.html> in order to know existing applications

The RSS technology used in the iUOC project enables the straightforward and effective scaling of the MyUOC virtual learning environment for multiple devices. This native application for iPad is just the first step in this direction. iUOC guarantees access to the virtual campus regardless of the mobile platform used, which considerably reduces scalability costs in the move from Web to portable environments and also maintenance costs. Having the teaching content in different formats also results in a reduction of the costs in logistics inherently entailed in print publishing. Furthermore, the compatibility of the virtual campus with different devices has a direct impact on the students as they can use devices they already have (and use for other purposes) for connecting to the virtual campus and, in short, for learning.

There could be no greater convenience for today's students than being able to decide for themselves when and where to do their learning. The technology used in the iUOC project allows multiplying access to the virtual learning environment from multiple devices, which will allow us to explore, through our students, the impact of the portability and the freeing up of time constraints on the learning process. In fact, one of the barriers people find to studying on-line is the lack of time for accessing a computer and working continuously for a number of hours. The aim of the iUOC project, once it has passed the pilot phase, is to reach the more than 55,000 UOC students through the inclusion of the application in the Apple Store so as to offer educational processes based on a model that is a lot less demanding in terms of time and space. This model consists in increasing the mobile scenarios from which the virtual learning environment can be accessed — of which the iPad application is only the first step, as we said previously — allowing users to increase the number of brief connections they make to the virtual campus using their mobile devices. This pilot programme will also explore the new educational possibilities that arise from this system.

Students can also benefit from the potential provided by using touch devices with 3G connectivity and a good-size screen that fosters new educational habits, such as the downloading of educational materials in audiovisual format and the frequent participation in social networks and in the communication spaces in the virtual learning environment. These benefits arising from the use of the iPad itself is also an object of study in iUOC.

As the UOC is an on-line university with more than 55,000 students in 50 countries, it is an essential requirement to provide support 24 hours a day, 7 days a week. With respect to the role that UOC faculty and the management team play in this learning process based on constant (24/7) support, it is vital to open the campus up to new devices to increase its portability and accessibility. In addition, RSS technology solves the problem of multi-device adaptation and establishes the bases for a scalable adaptation of the virtual campus to portable Web environments and native applications. In this way, iUOC is an initiative that aims to consolidate new multi-device and multi-platform scenarios that increase the accessibility, flexibility and usability of the learning environments. The final aim of this project is to make education available to a greater number of students, including students with physical disabilities (visual and hearing impairments, etc.) and those disadvantaged by their circumstances (because of restrictive timetables, not being accustomed to the technology, etc.).

4. PEDAGOGICAL IMPROVEMENT

The final objective of iUOC is to increase the flexibility and usability of the learning process at the UOC, which are, from our point of view, two necessary requirements for encouraging people towards lifelong learning, that is: *flexibility through providing students with the opportunity to decide when and where to study.*

Usability through (a) the development of an application (for the iPad) of the MyUOC Campus that has followed a user-centred design approach based on the requirements of the students in terms of portability and (b) the adoption of a touch and mobile device, which is very intuitive in its use, that helps to break the technological barriers that have kept older generations and those with less means out of e-learning up until now.

Students participating in iUOC have the ability to check their *mail, educational materials, classrooms, agenda and news from the university* literally in their hands. They, therefore, enjoy a high degree of accessibility and total autonomy in managing their time. This study will assess the importance of accessibility and autonomy with respect to an increase in learning productivity and efficiency.

This initiative will provide information to the community of e-learning instructors on the tools and the recommended teaching guidelines for where portable and touch devices are used for accessing the learning environment; a fastapproaching horizon about which there is a lack of information.

The iUOC project gives special support to key cross-cutting competencies in learning and to specific competencies of different material via the use of native applications (e.g., for second language learning). Thanks to iUOC, the Universitat Oberta de Catalunya is the first university in the world to have a virtual learning environment adapted to the iPad device in an interoperable manner through the design of a native application that communicates with the virtual campus via RSS technology.

5. THE PILOT

The main aim of the iUOC project is to study the learning possibilities offered by the iPad or any other mobile device (small size/weight with 3G connectivity and a touch screen). The result of this pilot programme will translate into a scenario in which lecturers and tutors have, from the very beginning, valuable information on a new device, the iPad, and its possibilities, which will provide them with greater control in designing courses and choosing tools. The student will also receive a much more versatile educational offer that is in line with the richness of the current market. Only in this way, and thanks to iUOC, can lecturers and students have a truly customizable learning environment. As mentioned above, owing to the iPad's relatively recent advent, there are still no studies on virtual learning environments specifically designed for this device, even though it has been a great success commercially. The iUOC project aims to fill this void by developing a native iPad application that communicates with the UOC's virtual learning environment in a customizable and scalable manner and allows taking full advantage of the interactive characteristics of this device.

In order to carry out the pilot test, Orange Spain facilitates an iPad device with 3G connection to 45 students and teachers from the university. The objective was to test the use of an iPad device with the iUOC application as part of their current studies during a term.

We obtained the assessment results using different methodologies that were both quantitative and qualitative, and we explored aspects such as user satisfaction, technology appropriation, pedagogical use and global assessment of the implementation. We used these different techniques to gather data:

- User Satisfaction Scale
- Questionnaire with open questions (for gathering data on the appropriation of the device)
- Focus Group with teachers
- Use and Satisfaction Questionnaire of 3G service connection
- Usability tests of iUOC app

The conclusions from the analysis of gathered data are:

1. The iPad with 3G connection is a good tool for education; apart from the iUOC, different applications help students and teachers in their daily tasks.
2. The iPad is well accepted and used for reading, visualizing and searching information.
3. Despite its positive feature of fast access to information, the iPad is not a good tool for writing and creating content.
4. Students and Teachers don't know exactly which are the pedagogical and technical possibilities of iPad devices.
5. The iPad could help teachers to imagine and conceptualize new ways of designing activities in a more dynamic way, which could involve a change in the pedagogical model.
6. Referring to the iUOC, both teachers and students reveal that the application is user friendly and intuitive.
7. 3G connection is highly valued, like that of other technical aspects such as speed and wifi connection.
8. 3G connection facilitates the use of the iPad anytime-anywhere, and this is essential in order to incorporate this device in learning processes.

On the whole, we can say that students and teachers evaluated the iPad positively as it can help to obtain information as a communication tool between them and as an interactive support for learning.

6. CONCLUSIONS

The iUOC provides fast access to learning contents and spaces of communication of the Virtual Learning Environment of the Universitat Oberta de Catalunya in a scalable way that allows us to provide the necessary information to design other native applications for different mobile devices.

As a conclusion from the pilot test, we can state that the iUOC primarily shows how the iPad and connecting to the virtual learning environment using this device not only permits students to study anywhere and at any time, but also catalyses new learning experiences, owing to the tablet's interactive capabilities. In that sense, we should complete the experience of access to VLE and digital contents with interactive and specific native apps for education, according to the subject area chosen.

7. REFERENCES

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