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## **THE USE OF MOBILE TECHNOLOGIES BY THE PORTUGUESE ACADEMIC COMMUNITY: AN EXPLORATORY SURVEY**

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### **ABSTRACT**

As a result, studies in the field started to arise in Portugal, both at the higher education level and at the secondary education level. In order to get to know the use that the Portuguese academic community makes of the mobile technologies, either for personal or classroom use, a survey was carried out with students, professors, researchers and staff from public and private universities from north to south. The findings show that the majority of the community members have sufficient technological means to access this kind of technology. In spite of this, it is still not widely used, even though the individuals believe in the potential of its didactic implementation.

### **KEYWORDS**

M-learning, Mobile Technologies, Internet, Technologies

## **1. MOBILE TECHNOLOGIES AND MOBILE LEARNING**

Nowadays the use of technologies is essential to schools, either at the hardware or software level, since it adds a number of benefits, the first of them being the expansion of the educational boundaries and possibilities. The equipment downsizing has launched new mobile technologies such as: notebooks, calculators, PDA (Personal Digital Assistant), smartphones, mobile phones, electronic agendas, pagers (also known as bips), among many others. Additionally new needs have emerged, the main being: the access to information and the individuals' connectivity.

The mobile learning is characterized by the use of mobile devices in the teaching and learning process. This modality allows learning to be independent from time and geographical space limitations with maximum mobility and connectivity (Bottentuit Junior & Coutinho, 2007).

In Portugal some uses in the field started to arise both in the higher education and secondary education. In order to get to know the use that the Portuguese academic community makes of the mobile technologies, either for personal or classroom use, a survey was carried out with students, ex-students, professors, researchers and staff from public and private universities from north to south.

The information and communication technologies (ICT), due to the extraordinary evolution of the scientific knowledge, which the technologies themselves also restrain, have been, in the last decades, structural for: new forms of work organization (telework, mobile work, blended work both present and at distance), production and consumption (e-business and e-commerce), communication, new relations with the information and the knowledge (e-learning, m-learning, b-learning). (Coutinho & Bottentuit Junior, 2007a). The mobile technologies did not emerge recently, it is an old concept, but it has been evolving every day due to the huge possibilities that are being added to the devices. Heisenberg had already stated that: "in the future, technological devices are going to be, probably, inseparable from men, such as the shell from the snail and the cobweb from the spider". (Silva, 1999, p.53).

The mobile technologies are exactly what its name refers, i.e., portable technology that can be moved from one place to another without any loss. Examples of these technologies include: the laptops or notebooks

(portable computers), Palmtops or PDAs, smartphones, GPS devices (global positioning system). Mobile devices can still be set for the use of a variety of communication technologies, such as: wireless communications (WiFi), Bluetooth, which connects wireless mobile devices, third generation (3G) and Virtual Private Network (VPN).

According to Metcalf, 2001; Bottentuit Junior & Coutinho, 2006; Bottentuit Junior & Coutinho, C. P. 2007; Bottentuit Junior, Negretti & Coutinho, 2007; Paes & Moreira, 2007, these devices when applied to teaching allow: Classroom extension beyond the physical localisation, Incentive to the use of Communication and Information Technologies in the classroom, Message sending (e-mail and MMS, SMS); The access to electronic resources when a PC or a laptop are not available; Communication with a students and teachers' community beyond the institution space/time boundaries; The practice of field work outside the classroom, for instance, data collection, experiment record, electronic books reading (e-books) or case studies, as well as library research; Administrative information consultation, for instance, schedules and exams' dates; Among several other possibilities.

We believe that the Internet future is mobile and that learning through the distance modality will attract more and more students. Thinking on this possibility we have developed a virtual laboratory prototype to be accessed through mobile devices.

## 2. THE STUDY

In order to get to know how the mobile technologies are used by the teaching system in Portugal, we have decided to start off by listening to the students, professors and researchers from several Portuguese universities and polytechnic institutes. The reason why we have chosen the higher education academic community, in this first phase of the project, had to do with suitability and data accessibility, since it is in this teaching level that researchers develop their professional activity.

According to Babbie (1997), the survey is a data collection method, which allows the gathering of information by questioning the subjects and it is the most adequate process for enquiring large samples. In our study, and since we did not know the population's dimension and structure, we have resorted to a sample selection method of non probabilistic type (Charles, 1997), which combines either aspects from purposive type and convenience sampling (Shutt, 1999) since they were both taken into account and simultaneously: i) specific criteria for the selection of subjects to be questioned (students, professors or researchers in higher education institutions in Portugal), and ii) the easiness to access the contacts of the enquired subjects (e-mails).

Aware of the fact that the findings of a survey carried out upon a non representative sample of the population causes impediments to any ambition of the generalisation of the results beyond the questioned group (Black, 1993; Schutt, 1999), it was the researchers' concern to interpret the data always bearing in mind this methodological limitation. The questionnaires started being sent on the 30th December 2007 to the students and professors' e-mails of the institutions where the authors develop teaching and research activities (University of Minho and University of Porto). For study purposes there were used dynamic e-mail addresses of the institutions we had access to, as well as addresses obtained from a search on the pages of the universities and polytechnic institutes that had Internet sites.

In order to accomplish the survey it was applied a single electronic enquiry named "Mobile Technologies: Personal use versus Classroom Use". The enquiry developed by the authors was formed by 16 questions organized in function of the objectives: a) subjects characterization; b) Information about the ownership and use of mobile devices; c) Information on mobile learning and attitudes concerning this teaching modality.

As referred previously, in this study, we used a non probabilistic purposive type sample, in the sense that the selection of the enquired group was made based upon the criterion of belonging to the Portuguese academic higher education community. As the answerers recruitment process was made from the easiness of access and the authors personal and professional relationships, the final sample is of convenience and its representatively is limited to the enquired group, not being possible to extrapolate the results beyond itself (Shutt, 1999).

For statistic analysis purpose, we have counted with a total of 1.225 valid inquiries, which were submitted to us until January 15th 2008, last date established by the authors for receiving the fulfilled forms.

### 3.1 Analysis and Results Discussion

Of the 1.225 individuals who answer the electronic enquiry, 58% were male and 42% were female, 62% were between 18 to 25 years old, 20% were between 26 to 35 years old, 10% were between 36 and 45 years old, 6% were between 46 and 55 years old and 2% were older than 56 years old. When enquired about the university situation, 54% answered that they were academic degree students, 17% post graduation students (specialization courses, master's degree, doctoral degree's, post doctoral), 21% were university professors, 4% were in the others category (researchers, scholarship owners and other occupations) and finally 4% were ex students. There were 22 Portuguese institutions of higher education involved in the study. As it was expected it was on the Minho and Porto Universities (institutions where the researchers had access to the larger number of e-mail contacts) that most of the valid questionnaires in the survey were obtained; together the members of these two academic communities represented 78% of the total number of subjects who integrated the sample.

#### 3.3.1 Ownership and use of the Mobile Devices' Services.

The first and one of the most important questions for the validity of the rest of the questions in this section was to enquire the ownership of mobile devices. When they were questioned if they owned a mobile phone, smartphone, PDA or other mobile device, 88% said they owned a mobile phone and 11% of those individuals answered that besides the mobile phone they also had a PDA or smartphone, and only 1% said that they did not have any kind of mobile device. Nowadays, mobile devices offer a very varied range of services. Among these we can exemplify the messages services MMS, SMS, the digital video and photography, access to the Internet, chat (Messenger), mp3 and mp4. According to the findings, 72% revealed to have access to the internet from a mobile phone, only 25% said they did not have access and 3% were not able to inform if they had it or not. The message services are the most used. About 76% of the enquired informed that they use that service many times. Regarding the photography's and digital videos, these are not very utilized. If we sum the categories "less" and "almost never" we have then, more than half of the individuals (64%). The chat service via mobile device presents a result that demonstrates the little success of this functionality among the academic community, i.e., 46% reveal that they have never used this service. Another possibility of these devices is its use as a means for audio files storage. For this service 78% of the individuals reveal that they use often this functionality. This high number can be explained by the high number of participants between the ages of 18 and 25, who seems to use this resource regularly.

#### 3.3.2 The use of the Mobile Device in an Educational Context

As we have seen in the literature revision, mobile learning is characterized by the use of mobile devices in the teaching and learning activities. When enquired if they had ever heard about mobile learning (m-learning), only 39% revealed they knew the concept, while more than half (61%) still did not know this teaching modality. When we questioned the individuals if they had used some kind of mobile device in interaction with some learning practice (in education) the great majority (48%) revealed they had never used any kind of device. However, 25% state that they had used mobile phone, 15% the tablet computer, 7% the pocket PC and 5% the Palmtop or PDA. In this last question we asked the subjects for an opinion on aspects regarding the educational potential of mobile devices. According the analysis, where there is an highlight on the frequency of individuals who had answered each item and the absolute values of the degree of the dominant agreement, we can draw in perspective a general frame of very favorable opinion of the subjects of the sample, regarding the educational potential of mobile devices in education.

The vast majority of the individuals involved in the study stated that they believed in the educational potential of mobile devices and that they would like to use them in the classroom. This is also confirmed through the obtained data in item 3, which should be interpreted in reverse, since it is written in the negative form. The enquired also stated that in the future there will be a greater use of mobile devices in education, as well as that it is a good idea to have access to the subject's content in any place and any time from a mobile device. Students also disagree that they do not use the mobile devices services in the classroom due to ignorance or lack of technological structure, as well as discordance not knowing any strategy where mobile devices can be used. There was a very large balance between concordance and discordance when we calculated the results of the item "I do not know any site or specific software for mobile devices".

## 4. CONCLUSION

The findings of the survey undertaken with the members of the Portuguese higher education academic community sample, confirmed a reality that, in a certain way, we had already foreseen: i) the majority of the enquired own mobile devices equipped with services and access to the internet; ii) the most used services by the enquired are the instant messages (MMS and SMS) as well as the audio files; iv) there is still little use of these devices in the classroom; v) the majority of the enquired academic community is not familiar with the mobile learning concept; vi) even though the academic community, who integrates our sample, does not use the mobile devices in educational context, they do believe in the educational potential of these devices and they also would like to use them in their daily activities. In sum, we can conclude, by evaluating the sample answers, that the Portuguese higher education academic community is now technologically prepared for this new teaching modality, even though considering that its expressive numeric size is not representative of the population. However, in pedagogical exploration terms, its use is very limited, requiring a major incentive and also teachers training in order to integrate these devices in teaching and learning.

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