

# THE CHALLENGES OF MOBILE COMPUTING IN EDUCATION: A SURVEY OF THE PRIMARY ISSUES

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## ABSTRACT

This poster reports the results of a survey. Approaches to address the use of mobile computing in education are identified, along with their shortcomings. This piece of research aims to understand the student needs within a mobile learning environment, as a starting point for exploring and envisioning possible functionalities to improve students' experience.

**Keywords:** mobile devices, learners community, technology-mediated learning, located information access

## 1. INTRODUCTION

In the past five years [2], handheld computers have begun to migrate from the corporate world to the classroom. The same features that have made them popular tools in business have ensured that mobile and ubiquitous computing is becoming a certainty.

A mobile device may not be appropriate for all kinds of information manipulation and this paper discusses the suitability of mobile devices within education. This research focuses on creating a successful learning experience via the use of mobile technology in computing. The requirements for the creation of said environment are elicited from a user needs analysis conducted amongst the first year students at the Department of Computing. As mobile devices are often brought to university and many students use them during lectures, a survey was carried out to acquire information about the student body expertise and its use of this kind of technology.

## 2. SPECIFICATION OF RESEARCH TOPIC

Mobile technology is changing daily so that it is rather difficult to speak about a specific and consolidated product. It is more likely to speak about a great variety of devices providing a wide range of functions combined in several different ways [5].

The main mobile devices peculiarities that are considered relevant for this purpose can be summarised as follows:

- Portability

- Personalisation
- Interconnectivity
- Unobtrusivity
- Adaptability
- Context interaction
- Remote access
- Availability

Mobile devices, according to some of their features, i.e. the physical ones such as size and weight, are not suitable for some kind of tasks, such as text reading, picture manipulation, or long use due to their memory capability. On the other hand, they have Internet connections and many methods of wireless interaction with both mobile and non-mobile devices.

The use of mobile devices is particularly effective when applied to a context related activity. For example, in a learning activity, new mobile technology can equip learners with reliable tools that enable them to learn anytime and anywhere [4]. A learning experience is not a one-way communication, but rather more like a cooperative activity. The use of mobile technology in education can assist educators in creating a more dynamic interaction with the learning environment for students. At the same time, it can also support learners in creating a cooperative community distributed in a virtual space [3].

Therefore, some of the most representative examples of learning activities can be considered to be:

- Acquiring knowledge
- Sharing knowledge
- Manipulating information
- Cooperating with peers
- Storing data
- Interacting with the context
- Validating results

Initially, most applications of mobile devices were mainly focused on personal usage. However, nowadays, the occurrence of people using the mobility of their

artefacts to coordinate their everyday interaction is increasing, either in a domestic, working or leisure context [4]. According to this, such technology can be successfully used in a learning context to support social interaction, which is of primary importance for sharing information, ideas, constructing understanding and shaping knowledge [1]. Compared to previously well established technology, mobile devices have the added value of enhancing activities in physical spaces enabling the integration with located and distributed systems.

### 3. SURVEY

The survey conducted so far has been a basic questionnaire aimed at providing an initial overview of the situation amongst students in high education. It was submitted to university students in the Department of Computing at the University Central Lancashire.

Some relevant results from the survey can be summarised as follows:

- Amongst students in higher education almost the totality of them own a mobile phone, used not only for phoning and texting, but also to capture data, connect to Internet and connect to other devices.
- There was an almost complete agreement that a mobile device would be useful to support and enhance learning activities, especially when it comes to collecting data, taking notes in the classroom, surfing the Internet, searching for references, reminding of deadlines, exchanging information with friends, colleagues or lecturers, transferring data or files to fixed devices in order to manipulate them, print or edit.
- There was a considerable percentage of students who thought that the increased use of mobile technologies in their learning activities would enhance their learning experience. However, a small percentage of students were sceptical about the use of mobile devices in education, especially if it added to their spending budget.

### 4. CONCLUSION

This research is the starting point for envisioning possible scenarios of learning activities enhanced by mobile technology.

From the analysis of the data gathered so far, a diagram has been derived [Figure 1], which includes some of the relevant elements involved in this context and clustered according to their roles. It will be of help in analysing students' use of mobiles devices in learning activities and in eliciting the main requirements to envision valuable new functions.

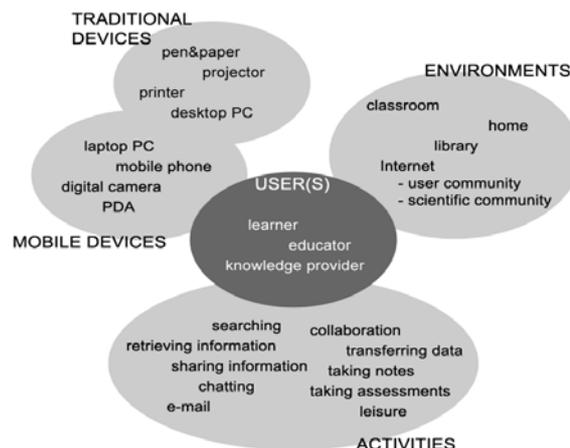


Figure 1. A learning activity context

### 5. FUTURE WORK

Future work will include further research to try and attain concrete requirements in order to design some functionalities which better exploit mobile devices potentialities and overcoming their limits, integrating it with more appropriate tools.

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