

Possibilities of application of e-tools in education: mobile learning

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Abstract

In our "information society" education is more and more taking advantage of computer technology which can enhance and improve the teaching and learning process.

The traditional classroom, teacher, textbooks, blackboard, can no longer satisfy the needs of generations of students used to handle technological tools since their childhood.

ICT tools have many advantages, thus teachers as guides and tutors, should expand their skills and competencies.

There are different types of ICT tools, for example video-conferencing, forum, chats, instant messaging, blogs, wikis, ipod, and different methodologies that can be used according to students' needs and learning styles. They enhance communication, interaction and the quality of learning. Teaching and learning materials are more flexible and can be updated continuously.

One of the most recent and innovative technological device is the mobile phone which represents a revolution in education as it gives the opportunity to learn "in motion", making the learning process more appealing, interesting and motivating.

Wireless technology includes mobile phones, blue tooth, smartphones; it is a challenge for students and teachers and can really change the way of doing education. It can be applied to different learning methodologies and be used to help disengaged students and students with disabilities.

Together with the many advantages in education, mobile devices have also some disadvantages, such as small screen, small keyboards, but, as mobile technology is constantly updating, will be probably solved in the near future.

1. Introduction

Computer technology is becoming more and more important in all fields especially in education. It represents a dynamic, new way of learning and a support for the teacher. But there is still a big gap between technology and its application in school.

School does not renew its technologic structure in a frequent way, and at present the most practical possibility is that teachers expand their skills and competencies about ICT to avoid the differences between them and the students that are more and more able of using computer tools. Thus ICT tools can be seen as a peculiar challenging medium as they can provide users with a wide range of stimulating, didactic, auditory, visual materials. However, they cannot substitute the text book or the relationship face to face with the tutors but they may enhance that process of learning that starts from the student him/herself. The student is more aware of his/her capabilities, masters his/her knowledge, exploits the object by which he/she can interact with the environment and learn.

In brief ICT tools may:

- Help students to improve their skills and competencies
- Facilitate the learning process as students have the possibility to explore, analyse , discover, choose activities which are real and meaningful
- Enhance interaction between real and virtual environments
- Favour self learning and learner centred approach
- Favour interpersonal relationship by avoiding any hierarchical barrier

1.1 Methodologies

ICT focuses on methodologies by which students learn in and outside the traditional classroom, they know how to do, they learn by doing, they are constantly aware of their process of learning, they can get a continuous feedback, they can customize their learning, they learn at their own pace. Learners and teachers can track the learning path anytime, everywhere.

Distance learning, e-learning systems enhance the possibility for students to leave the "traditional classroom", to attend lessons in remote locations, to live real contexts and communicate actively by means of chat, video-conferencing and other computer devices. However it is essential to note that

learners have always the possibility to acquire their knowledge through traditional ways such as the face-to-face teaching and contact to avoid students stay alone with the machine or the physical absence of the teacher. Thus blended learning, which is the combination of e-learning and traditional face to face methods, may overcome such problems.

These ways of learning offer users multimedia, flexible, interactive teaching and learning materials through access to the Internet. However, other tools are at present more innovative and student centred, they concern **the use of mobile phones and other wireless, computing devices. Mobile learning**, M-learning, is quite recent but the experience so far has been surprisingly motivating for students and teachers because it represents at the moment an effective teaching tool for the teacher.

2. ICT Tools

ICT provides an interesting learning environment, the virtual classroom that allows users to participate the learning process without travelling and let people interact from different places. The tools used are numberless, they range from video-conferencing, Internet with hypertexts, interactive learning objects, audiovisual materials, forum, chats, instant messaging, blogs, whiteboards, wikis, ipod. They all offer synchronous and asynchronous communication. But in recent time there has been a sort of "revolution". People are more and more attracted by mobile phones, the majority of people have got at least one mobile phone, employees use them, students use them, even at school, in the classroom despite school regulations against their use during lessons. So, why cannot we take advantage of this situation? Why cannot we exploit the potentiality of this device? Why not?

In this context and from the didactic point of view, we are going to give an account of the least known but most innovative device, the mobile phone.

2.1 M-learning

There is an interesting literature and experiences about the use of mobile phones in education. Among the e-learning tools, m-learning (learning by mobile phones, PDA or Personal Digital Assistants, palmtops, GPS) can represent a peculiar way of doing learning and according to Keegard [1], can represent a sort of evolution of e-learning, a natural process from distance learning and e-learning. M-learning can enhance learning by putting students in a real context and make the process of learning more appealing, motivating, interesting. Students may maximize their acquisition of skills, competencies, may optimize their time of studying. **Students simply go out from their classroom, offices, they are not compelled to stay in a place with a personal computer/laptop. They learn really and immediately, everywhere, in any time**, while they are walking, travelling, doing their routine actions, and above all **"in motion"**. As stated in the *Guidelines for Learning/Teaching/Tutoring in a Mobile environment*, (O'Malley ,et al.) [2] " there are 4 types of learning locations: home, the workplace, a place of leisure (theatres, museums, sports clubs) and other public locations (on the bus, at the travel centre). Learning happens at any time of the day, on working days or weekends. The learning practice is thus "mobile" with regard to location, time and also topic area and as a consequence technological tools in support of learning should be mobile, too."

2.2 Mobile technology

M-learning represents a challenge for students and teachers.

The possibility of using mobiles in education has rapidly grown since the last decades along with other technological tools such as PC. Employees, businessmen, students are using mobiles phones, so this kind of technology can modify the way of doing education.

It is a sort of revolution because it could

- change the relationship between students and the technological object
- create new learning environments
- be synchronous and ubiquitous

2.3 The characteristics of using these tools in details

Mobile phones

You can bring them everywhere, they are ubiquitous, you can register everything, write, see videos and so on.

Bluetooth

A wireless tool enabling a range of e -devices to connect and communicate simultaneously in proximity (from 10 to 100 metres). It is used to exchange data, voice transmissions, print and fax, synchronize PDA, laptops.

Smartphones

Mobile phones with the same functions as a personal computer by which users can

- Keep everything organized
- View, edit documents
- Synchronize documents with laptops, PCs

2.4 The application of mobile technology in education

The advent of wireless technological tools such as mobiles phones, smartphones, Bluetooth make their application possible in education.

Data are taken from GPS, Bluetooth, from objects to objects. The distance student is free to move and learn away from his/her place of studying (school, university, college).

As far as the use of these tools in education is concerned, not all courses are suitable for a m-learning environment, but short courses are considered suitable for this kind of learning. The use of quizzes, glossaries, the interaction with tutor and other peers, may satisfy a wide range of needs and aims on behalf of students.

Communication takes place through e-mails, SMS, MMS, and it is important for students a feedback on their progress.

3 Examples of m-learning

3.1 Application of m-learning in the teaching of foreign languages

An interesting application of m-learning has been carried out by the Stanford Learning Lab for the teaching of the English language. Students were given quizzes, glossaries, interactive audio-files, to improve their pronunciation and language competencies/skills.

Besides this, it is relevant to cite two mobile language learning experiences that were developed by Thorton and Houser [3] in 2003 for the acquisition of English vocabulary and idioms on mobile phones and PDAs . The first through SMS and the second by means of videos.

Another application of mobile learning in the study of languages is Pocket Eijiro [4], an English-Japanese, Japanese-English dictionary, started in December 2002.

3.2 M-learning for disengaged students

M-learning has been used to help those students who are outside formal education, who have abandoned their studies, teenagers no longer motivated by traditional curricula, and to prevent the risk of leaving school. A project carried out in UK, Italy, Sweden shows students using mobile phones and smart-phones to learn mathematics through SMS with the help of a tutor in an informal environment, out of school, outside. They could send text messages, keep in touch with friends, play computer games, learn by doing.

3.3 M-learning for disabled students

M-learning can also offer educational opportunities to impaired students in order to overcome some of the barriers encountered in a traditional learning.

Motor impaired students may access to PDAs and mobile phones more easily because they are light and easy to handle.

Visual impaired learners can use PDAs with text to speech software installed.

Deaf learners can take advantages of the rich visual content of PDAs such as photos, images.

Dyslexic learners may receive benefits from navigating web resources and also use the rich visual material offered by PDAs

3.4 Conclusion

The relationship between the mobile and the student depends on the medium and not on the environment. So the user is no more constrained to have a PC to optimize his/her time for learning because the mobile is "comfortable" and easy to access to learning.

Interaction is vital in learning and the place does not interfere with learning. M-learning can substitute the PC/laptop which is not always within reach, the mobile can be used for the acquisition of knowledge, may help to speak in a foreign language, may help students with difficulties in a more appealing and motivating way.

4. Examples of the use of mobile phones according to learning methodologies

Naismith, Lonsdale, Vavoula, Sharples envisage six models of M- learning based on the main learning theories:

- **Behaviourist** following the stimulus/response.
The videogame Skills Arena was designed for learning mathematics. Users can create characters, play away the classroom and improve their knowledge.
 - **Constructivist** following Bruner's theories [5] by which learners construct their ideas based on their previous knowledge. The environment is realistic, Colella (Colella 2000) [6] refers to a participatory simulation, the virus game about the spread of a virus. Students were asked to simulate and observe the spread of a virus moving in the classroom, see themselves face-to-face. They were given thinking-tags, badges with red lights proving if they were infected or not. Students were concentrated on speculations about the beginning of the disease, how it was spread, who caught it. The results were good, the simulation was interesting, there was interaction.
 - **Situated model** Learning occurs in real contexts such as a laboratory, a museum, a gallery, an open space. An example of this model concerns a project carried out in Equator, "The Ambient Wood", where children are in a wood acting with a PDA; they move, act, make hypothesis about plants and animals. They interact physically and digitally.
 - **Collaborative** Learning occurs by a sort of wireless communication peer to peer, small groups of students communicate face to face through the use of palmtops (Universidad Catolica de Chile, from 2002 to 2004).
 - **Informal and lifelong Activities** are performed outside a learning environment such as schools; the focus is on learning in everyday life, and this enhances the importance of mobile phones in the learning process.
 - **Learning and teaching support** Teachers can use mobile phones to
 - Report
 - Review students' activities and give marks
 - Access to school data
- By using mobile phones, students can get
- Learning materials
 - Information about the courses
 - Feedback

5 Advantages/Disadvantages

As mobile technology is constantly updating, many of the present problems will be certainly solved in the near future. Here is a possible list of advantages and disadvantages in the use of mobile devices in education

5.1 Advantages

Mobiles can represent a real challenge compared to other e-learning tools.

Users can

- Personalize their environment
- Do the learning experience outside the classroom
- Learn by recording, organising over time
- Take advantage of the benefits of an informal learning
- Be more motivated
- No more forced to use PC as the only object to have access to materials, knowledge

5.2 Disadvantages

The use of mobile devices may show some difficulties :

- Small screen size
- Limited memory size
- Small keyboards
- Limited battery life
- High costs
- Possibility for mobile devices to be misplaced or stolen
- Difficulty to use mobile devices in noisy environments

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References

- [1] Desmond Keegan, The future of learning: from e-learning to m-learning, http://www.fernuni-hagen.de/ZIFF7ZP_119.pdf
- [2] O'Malley et al. O'Malley, C, Vavoula, G, Glew, JP, Taylor, J, Sharples, M and Lefrere, P (2003). Guidelines for Learning/Teaching/Tutoring in a Mobile Environment. www.mobilearn.org/results/results.htm
- [3] Thornton, P., Houser, C. (2005), Using mobile phones in English education in Japan, Journal of Compute Assisted Learning, Vol. 21, pp. 217-228.
- [4] Japan media review - Language E-Learning on the Move <http://www.ojr.org/japan/wireless/1080854640.php>
- [5] Bruner, J. (1966). Toward a Theory of Instruction. Cambridge, MA: Harvard University Press.
- [6] Colella, 2000 The virus game <http://education.mit.edu/pda/games.htm>

Other references

Katseff C./Share, Capturing playfulness in the design of digital learning environment for adults, www.tii.se/share

Naismith L., Lonsdale P., Vavoula G., Sharples M., Literature review in mobile technologies and Learning, University of Birmingham. FutureLab Series, Report 11-2004 www.futurelab.ort.uk/research/lit_reviews.htm

DMobile learning explorations at the Stanford Learning Lab. Using mobile web and video phones in English language teaching: Projects with Japanese ... lit.msu.edu/vol10num1/emerging/default.html

Georgiev, T., Georgieva, E., Smrikarov, A. M-Learning-A New Stage of E-Learning, International Conference on Computer Systems and Technologies, CompSysTech'2004

M/Cyclopedia of New Media, M-Learning-Disadvantages of M-Learning Technology http://wiki.media-culture.org.au/index.php/M-Learning_-_Disadvantages_of_M-Lear...

TechDis, A model of accessible m-learning http://www.techdis.ac.uk/index.php?p=9_5_32_3

Rivista "La scuola che cambia", Teaching experiences and practical ideas, gennaio 2001