Mobile Lessons: concept and applications for “on-the-field” georeferenced lessons.

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Mobile Lessons: the concept (1)

- On-the-field lessons should be a complementary activity to traditional scolastic lessons taken into a classroom

- With *Learning by doing* we can obtain a better involvement of students and a better effectiveness of lessons

- We focus on actors’ mobility (teachers, students, ...)

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Mobile Lessons: the concept (2)

- Our idea is the realization of a georeferenced system that allows to:

  - Bring lessons from classroom to a site of interest
  - Verify what learned in classroom
  - Make more interesting and exciting the lesson
Mobile Lessons: the concept (3)

Examples of Mobile Lessons should be:

- **History:**
  - Tour of monuments in a city
  - Tour of archealogical sites: i.e. Nora, Barumini, Imperial Forums, …

- **Geography:**
  - Studies on minearology and other subjects directly in the places of interest

- **Biology/Ecology:**
  - Studies on trees, plants
  - WWF paths
Mobile Lessons: the concept (4)

- A fundamental role plays the *georeferenciación*: lessons data is bound to particular points (HotSpot) well-defined into the scenario of application (“the playground”)

- Massive use of GPS (Global Positioning System)

- *Mobile* devices are used to allow a complete freedom of moving inside the playground
Mobile Lessons concept should be viewed as a sequence of four main steps:

1. Design of a Mobile Lesson (including the on-the-field authoring)

2. Preparation of the students, in classroom, about the lesson and its subjects

3. On-the-field experience (the lessons become mobile!)

4. Feedback in classroom and deepenings
Mobile Lessons: technologies

- Tecnologies:
  - Mobile Devices:
    - PDA, TabletPC, smartphones
  - GPS
  - Java
  - XML
  - XUL
  - C#
  - Browsers GPSWeb enabled
Mobile Lessons: GPSWeb

- Its objective is to improve the Web browser requests

- It is realized through plug-ins installation
  - For Mozilla Firebird/Firefox and Microsoft Internet Explorer

- The GPSWeb module reads the current position from the available GPS hardware and adds the “User-Location” HTTP header to each browser request. The Web applications can return on-the-fly created Web pages specific for the position.
Mobile Lessons: architecture and technologies

(2): GPSWeb

Web Application
with position management

HTTP Request with
User-Location header

Data

GPS Coordinates

Web Application
Examples of headers

- User does not want to send his position
  - User-Location: N/E

- The position is not available
  - User-Location: N/A

- The position
  - User-Location: +38.78800;+008.89900
Mobile Lessons: prototype and experiment (1)

- An application was experimented on the archealogical site of the phoenix-punic-roman city of Nora in Sardinia with a class of 12-13 years old students. The mobile lesson was organized as a timed “threasure hunt”

  - Teachers identified the points of interest (HotSpot) into the site (georeferenciacion, GPS coordinates), i.e. the forum, the theatre, the termal building,... prepared addictional information and tests
  
  - Students had to find this points. The application was able to check if the point was reached/FOUND or not
  
  - To every single HotSpot one or more tests were associated
  
  - A score was associated to each HotSpot and each question to motivate the students and to give them the feeling of a game.

- Students moved around the site equipped by PC notebooks e GPSs
Mobile Lessons: prototype and experiment (2)
Future on development!

➤ Architecture evolution:
  • Only Web architecture with GPSWeb enabled browsers:
    • Better fruibility by browser equipped devices
    • Use of standards scripting languages (JSP, PHP, ASP, …)
    • No needs for application client installations

➤ Cultural tourism application!
Conclusions (1)

- The on-the-field experiment of Mobile Lessons at Nora has marked the concept validity about this pedagogic and technological approach:
  - Good didactical tool complementary to classic lessons taken in classroom
  - Good students interest
  - Full-immersion and direct experience into the places and the subject studied
  - Better feedback to teachers
  - Position-aware web information system

- The concept itself is open and several implementations (also with various technologies) should be implemented.
Conclusions (2)

- Extensibility!

- New technologies come to help us:
  - i.e.: more powerful devices with integrated GPS hardware, better connectivity, UMTS...

- Mobile Lessons and **GPSWeb** are research projects at CRS4.
Thanks for your attention.

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