GeoJournal: Enhancing experiential field-based learning

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Abstract

The implementation will allow a range of staff to embed links to abstracts, full text PDF files, images taken in the field and other multimedia including links to internet sites and further reading via a simple mapping interface. Changes and updates may be made incrementally to an existing GeoJournal base area without requiring in depth ArcMap GIS knowledge.

The poster illustrates the GeoJournal interface for an area of California visited as an in-field teaching module on a 3rd year drylands geomorphology module (GY391). GeoJournal has been designed for use both in field (on tablet PCs) and laboratory; for the module (GY391) illustrated here staff will use GeoJournal to support student reflections on themes, processes and places on their return from the field site. Student evaluations regarding the effectiveness of the tool for post-hoc reflection will be carried out in 2007/8.

Methods

While the place of fieldwork as a vital teaching and learning approach has been vigorously reaffirmed in the geographical literature (Healey 2005, Panelli & Welch 2005), more needs to be done to integrate fieldwork into pedagogic strategies (Scott et al. 2005). As a tool intended to support student reflections on themes, processes and places on their return from the field site and hence bring closer together the learning spaces of lab and field, GeoJournal particularly provides a strategy for targeting this issue.

Tool design

GeoJournal was implemented as a customised template in ESRI TM ArcMap 9.1. An additional toolbar was constructed using Visual Basic, allowing a user to select whether they wish to view an abstract (a), full paper (b), Georeferenced Movie (c) or Georeferenced Image (d) via a drop down menu. This toolbar draws on data uploaded into simple database from an Excel spreadsheet, that can easily be updated with new readings by a staff user. Users simply click on a point symbol at a particular location on the map to view the media represented. ArcMap is available both via CSV across institution and also on the SPLINT tablet PCs, allowing GeoJournal to be used in a variety of static and mobile contexts.

Application construction

The GeoJournal example shown here is based on the Mojave Desert and Death Valley regions of California. In regard to the construction of this particular version of GeoJournal, satellite base data were downloaded from the USGS data server while readings were based from a list that is used for a 3rd year Undergraduate field course and sourced from the internet. For each of these readings, datasets were downloaded and web links to papers were found. These then were linked to reference points on the background map, and their co-ordinates uploaded into an Excel spreadsheet, making it possible to go straight from the map to the readings. To further enhance the project, photographic images from previous field trips were selected that best showed some of the prominent features and landforms in the area. These were then linked to the background map in a similar way. The last step in this process was to add movies to the map; for this initial version of GeoJournal, screen capture methods were used to capture fly-throughs of areas that are encountered on the field trip within Google Earth.

Application context

This region was chosen because it is the site of a 3rd year experiential learning field course module "Drylands Geomorphology GY391". GeoJournal has been constructed both in field (on tablet PCs) and laboratory: for the module (GY391) illustrated here, staff will use GeoJournal to support student reflections on themes, processes and places on their return from the field site. Student evaluations regarding the effectiveness of the tool for post-hoc reflection will be carried out in 2007/8.

Using GeoJournal, our intention is that students will both be able to check references for locations visited on tour, and make connections between landforms and processes identified in the literature. The central figures show the various media views available. In (a) for example, a user views an abstract on self development learning to like evolution and could go on to view the full paper by clicking on the web link provided if the article looks to be of particular interest.

In this particular instantiation of GeoJournal, multiple databases have been entered separately to allow different pedagogical themes to be highlighted. Piedmont junctions, lakes and playas, alluvial fans and aeolian structures form in distinct geographical contexts relating to underlying geology and terrain as well as the more general climate characteristics of the region. Further, versions of the software tool might include also further base mapping layers for geology and/or elevation, depending on student evaluations; our initial goal was to provide a simple, streamlined interface.

Discussion

At this point in time, the technical aspects of the first GeoJournal prototype have been completed and implementations have been developed for two field sites, that of California (above) and a second version for Almeria in SE Spain. Both are field sites widely used by the International geographical/geological community, such that with successful local evaluations the project is poised to maximise practical engagement with the geo-tagging concept. Firstly however, we need to know the impact of the GeoJournal tool on the learning process, both in terms of bringing together links between in-field learning and subsequent independent follow-up by students and also the degree to which a tool such as this can encourage both wider and deeper engagement with the scientific literature. Evaluations using Laurillard’s (2002) Framework for Learning will be carried out in 2007/8 with the students of Leicester’s Calafien Drylands module GY391. This module will evaluate GeoJournal as a post-hoc reflective tool; it is expected that the Almeria example will be explored as an in-field learning tool that integrates both the scientific literature and GeoWalk podcasts in conjunction with Kingston University.

A number of technical issues arose when designing GeoJournal, in particular concerning the development environment. While ArcMap has a widespread following as GIS software, for Universities of departments not subscribing to the software the purchase cost would be prohibitive; in many senses then, the dissemination of GeoJournal is implicitly targeted at present at those who are spatially aware yet the spatial aspects of the literature could arguably be of much broader value to a range of disciplines where papers have locational context. As a prototype, ArcMap was an efficient and cost-effective route to develop the GeoJournal concept. However, as the tool developed to incorporate photographs and movie files on request from student staff members, we might equally use Sentinel One for an ArcMap (or Google Earth) tool; it is apparent as to whether the GeoJournal should be conceived as a component of a virtual field course (VFC). Software such as VR Broomstick_d*, designed to build flash web interfaces, are better designed to manage and connect different forms of visual media in the manner of a VFC, but are not equipped to manage pdf or word documents. Philosophically however, our tool differs from a VFC in that it seeks to connect with the existing literature rather than provide extra information. What is intended to support students in making connections between papers as they stand and build literatures, interpretations and, rather than providing extraneous knowledge with an emphasis on visual material and quantitative data sets as is commonly the case in a VFC (Dykes et al., 1999; McConrow, 2005).

In terms of ease of use, the tool has been designed for development by non-GIS expert members of staff. Assistance may be required with the downloading and projecting of a new geographical base map for a new tool, but otherwise GeoJournal should be self sustaining as regards the updating and managing references and other materials. Staff at other Universities will need to update web links according to their own institution’s Athens permission codes; in-field versions of GeoJournal that link to digital copies of papers on disk will require copyright permission protocols to be followed on an institution-by-institution basis. The abstracts and locational information however, form the skeleton of a portable and transferable tool. Once basic evaluations have been carried out, the full template and skeletal geographical exemplifiers for California and Almeria will be placed on the web site for general dissemination within the geographical community and promoted via the HEA subject centre GEES.

References

