

# Experiences with a Virtual Placement

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## SUMMARY

The aim of this paper is to discuss experiences of using a series of on-line work-based exercises set up in the form of a work placement with a small GIS consultancy company. These experiences represent the first use of the package by staff not involved in its development.

Edina is a service unit within Edinburgh University Computing Services with a main role to supply datasets to the academic community, including Ordnance Survey digital mapping. The e-MapScholar project was set up by Edina to develop on-line educational material 'to enhance the usability and learning potential of spatial data resources'.

The aim one project within e-MapScholar is to take the advantages associated with work experience as part of an educational programme and combine it with the flexible learning possible by using web resources, resulting in the 'Virtual Placement'. The Virtual Placement involves students being employed by a virtual GIS consultancy and completing a case study involving problem solving using GIS. All communication with students is carried out electronically via fictional personnel of the virtual company, played by one or more academic staff. The case study is set up to run in the way such a project might operate in a small company. Students carry out a series of nine structured tasks, each with deadlines which can be set by tutors.

The Virtual Placement is being trialed with five postgraduate students as an optional module in the MSc in Geoinformation Technology & Cartography at the University of Glasgow. Staff responsible for the course recognised the value of work placement, but within the restrictions of a one year postgraduate course, with a significant overseas student enrolment, it was considered impractical to include a meaningful conventional work placement component. The Virtual Placement is seen as a potential solution to this dilemma.

The paper explains how the project is structured and the workshop presentation reflects on the experience from the point of view of staff and students.

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### **1. THE MSc IN GEOINFORMATION TECHNOLOGY & CARTOGRAPHY AT THE UNIVERSITY OF GLASGOW**

The Department of Geography & Geomatics have offered undergraduate and taught postgraduate courses in various aspects of the mapping sciences since the mid 1960s. Although innovated teaching methods have been included in these programmes and the use computers has long been a core element, relatively little use has been made of computer aided instruction or e-learning. A recent review of the structure and content of the taught postgraduate programme lead to the introduction of the MSc in Geoinformation Technology & Cartography. The focus of the programme is on understanding and managing the locational data underpinning Geographic Information Systems (GIS) together with visualisation and map production in a GIS environment. There is also scope for those interested in various GIS application areas to gain experience of using GIS in problem solving. The programme is designed primarily for those with little or no academic background in Geomatics or GIS and for those with a technical/practical background in the field seeking an academic qualification. The programme is available full or part time and it is also possible to study for a Postgraduate Certificate or Postgraduate Diploma.

In discussions about the overall structure of the new MSc programme, the desirability of including a work placement was considered, but discounted for a variety of reasons. The background of incoming students varies considerably, from those with a Geomatics degree, through those with Geography degree having some exposure to maps and GIS, to those with degrees in other disciplines with little background in maps and GIS. In a 12 month programme, only at a fairly advanced stage of the programme would it be reasonable to assume all students had reached a level of knowledge and competence to be of value to a placement provider. In the last 4 months of the programme the main requirement is for the students to work on a fairly substantial project leading to a thesis. If a placement is included any earlier, the problem is how to fit it into the programme of other classes; it would not have been possible to have a block placement and having students spending 1 or 2 days a week with an employer over an extended period was not considered to be desirable. This approach would also require placement providers to be local, and although there are a reasonable number and variety of employers in the Glasgow and central Scotland area, it was not considered practical to rely on being able to find enough suitable placements each year (in addition to those industry already make available to our undergraduates).

Discussions with employers also revealed that most considered that a 2-3 month placement was required to be meaningful. Again this was not feasible within the 8 months teaching period of the Diploma, however the programme does allow students to complete either the Diploma project (4 weeks full time, or equivalent) or MSc project (15 weeks) in conjunction with an external organisation (either paid or not) and even to switch from full-time to part-time to complete these projects in conjunction with employment. Finally, as we anticipated a

significant number of overseas students on the course, a compulsory work placement could pose problems with visas and also potential language and cultural issues.

Thus, the initial decision was that while work experience was seen as highly desirable, it would not be included in the programme, but students would be encouraged to carry out Diploma or MSc projects in conjunction with employers.

One module in the course is 'Issues in Cartography & Geographic Information Science' which represents half of the programme during the second term. This module is itself composed of a series of 'units' each representing approximately 50 hours of student effort. The opportunity has been taken to experiment with a wide variety of teaching methods in these units. A few units are very conventional lecture based courses, but these are the minority; most of the units rely heavily on student centred learning. Another feature of these units is that we have been able to utilise expertise beyond the normal academic staff of the department, with several of the units being led by locally based experts in particular topics.

The development of the Virtual Placement as part of the e-MapScholar project presented an idea opportunity to include a work placement element within the programme and also to 'test the water' with a significant e-learning element. The parameters of the Virtual Placement fitted in well with the overall structure of the 'Issues' module and so it was decided to offer it as one of the units within this module. It also gives the students an opportunity to apply GIS skills learned in earlier in the programme to a more comprehensive application project.

## **2. THE E-MAPSCHOLAR PROJECT**

Edina is a UK higher education national data centre, hosted by the University of Edinburgh Data Library. Digimap is a centrally-funded web service run by Edina that delivers Ordnance Survey (OS) cartographic products and digital map data across the Internet, via a simple-to-use interface. It provides convenient, on-demand access to some of the best and most detailed map data available anywhere in the world.

Evaluations revealed that Digimap both encouraged the use of OS data in teaching, and promoted the use of digital data in disciplines outside the traditional 'map domains' of geography and cartography. Over 80% of users were non-geographers and 60% were undergraduates (e-MapScholar, 2005). Evaluations also revealed that there was a skills gap between the ability to download simple maps from Digimap and downloading data and using it for analysis with a Geographical Information System.

The e-MapScholar project was established to fill this skills gap and support those with a variety of skill levels in handling Geographic Information. It has developed tools and learning and teaching materials to enhance and support the use of geo-spatial data currently available within tertiary education in learning and teaching, including digital map data available from the Edina Digimap service.

Several detailed teaching case studies have been produced consisting of the data and materials used by the learners, along with descriptions of the uses made of the data and learning materials, and evaluations by staff and students. Online learning and teaching materials have also been developed. These include a range of learning materials with interactive tools that allow users to develop skills in the use of digital map data and knowledge of geo-spatial concepts under three areas: working with digital map data, data integration and data visualisation. Associated with this, a teaching content management system has also been developed for teaching staff who wish to customise the online learning and teaching materials. Finally, a virtual work placement has been designed in which a student will carry out an assessment of the visual impact of wind turbines at the Nant Carfan development in Wales.

### **3. THE VIRTUAL PLACEMENT**

Problem-based learning represents a powerful pedagogic tool to develop student confidence and problem-solving skills. By linking the idea of a work placement with the web, a team from the e-MapScholar project have developed a proof-of-concept 'virtual placement'. This takes the form of a real-life problem from an outside partner organisation through which the learner has to work in order to arrive at a reasoned solution.

Web based learning is able to provide a range of learning experiences. It can also relieve pressure on hard-pressed academic staff by providing structured support material, controlling when access is available to this material, handling assignments and potentially automated assessment of certain elements. It promotes a student-centred approach and gives increased flexibility in when tasks are undertaken. There is also potential for distance learning and incorporating the concepts into continuing professional development.

The Virtual Placement provides many of the learning opportunities of a real placement, but takes pressure of the academic tutors to finding work placement partner companies and, once developed, represents a cost effective way of providing a work like environment. This is particularly true for subjects like the Geographic Information (GI) industry where work is increasingly carried out on-line and mirrors current developments in the workplace where there is a shift from traditional office environments to virtual organisations.

The aim of the Virtual Placement is to give experience of using digital Geographic Information (GI) and Geographical Information Systems (GIS) in a real-world work context (Mackanness & Cornelius, 2003). Students are placed with the 'Virtual Geo-Consultancy' company (figure 1). All contact during the placement is by e-mail with the staff of the company, played by course staff. E-mails to the company employees are automatically forwarded to the appropriate member of academic staff – all could be forwarded to a single tutor playing multiple roles, or several academic and technical staff may be involved. The four virtual staff members learners have contact with are the Company Director, the Client & Community Liaison Officer, the Senior Spatial Analyst and the GIS Technical Support Manager.

During the placement students carry out an assessment of the visual impact of wind turbines at the Nant Carfan development in Wales, using material provided by the Macauley Institute in Aberdeen. In addition to using Digimap data to satisfy various elements of the placement work, the students are provided with land cover data (Land Cover of Great Britain), wind turbine locations and height details (Countryside Council of Wales), road network (interpreted from Ordnance Survey Strategy data) and data on the boundary of common areas (Countryside Council for Wales).



Figure 1. The Virtual Geo-Consultancy home page

The Virtual Placement takes the form of a series of structured tasks:

- Task 1 – Induction & introduction
- Task 2 – Site Familiarisation
- Task 3 – Project Planning
- Task 4 – Data Preparation
- Task 5 – Analysis
- Task 6 – Further Analysis
- Task 7 – Reporting
- Task 8 – Reflection
- Task 9 – Debriefing

Tasks vary in duration from a couple of hours to a couple of days. Tutors are able to set up the placement to control release of information to students. Each task has a deadline after which work to be submitted can no longer be altered, or certain information may no longer be accessed. The timing of subsequent tasks can be such that no information is available until a previous stage is complete. It is also possible to plant 'bombshells' to mimic real-life work

problems through which the students must work. For example, Task 6 involves reworking the analysis following a decision to remove one of the wind turbines from the proposal. Having completed their own analysis and reported on it, Task 8 releases a report on the same development by a real consultancy organisation and requires students to compare the methods used and the results obtained with their own investigation.

During the placement, students have access to an online portfolio, in which they store their work. Tutors can access this to monitor progress. Tutors are also responsible for assessing submitted work and providing feedback on it.

#### **4. EXPERIENCE WITH THE VIRTUAL PLACEMENT**

The Virtual Placement was mainly developed by staff from Edina, the University of Edinburgh Department of Geography and an educational consultant. It was tested initially during its development with Edinburgh University GIS students. The incorporation of the Virtual Placement into the MSc in GT&C at the University of Glasgow represents its first trial by staff and students with no connection to its development. As this article being is written, students have just commenced the placement. It is being carried out over a period of about 7 weeks and students have several other course commitments during this time. The workshop presentation will reflect on the experience.

#### **REFERENCES**

EDINA home page – [www.edina.ac.uk](http://www.edina.ac.uk)

e-MapScholar home page - [www.edina.ac.uk/projects/mapscholar/index.html](http://www.edina.ac.uk/projects/mapscholar/index.html)

Mackness, W., Cornelius, S. (2004) *The virtual placement*. e-MapScholar introducing the technology workshop. The University of Edinburgh.  
[www.edina.ac.uk/projects/mapscholar/docs/wam-vp.ppt](http://www.edina.ac.uk/projects/mapscholar/docs/wam-vp.ppt)

Pickering, A., Mackness, W.A. (2003) *Virtual Placements in the context of e-learning: A Case Study in the use of Geographic Information* in Proceedings of GISRUK 2003 11th Annual Conference, Wood, J.(ed), City University, pp 260-267.

MSc in Geoinformation Technology & Cartography home page –  
[www.geog.gla.ac.uk:443/degrees/MScGTC](http://www.geog.gla.ac.uk:443/degrees/MScGTC)

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