The UNIGIS experience: THE use OF Internet FOR distance LEARNING in GIS

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With eleven years of experience in successful academic distance learning in spatial information management and geoinformatics, UNIGIS is one of the oldest distance learning initiatives. This is a valuable experience, with successes and mistakes that are typical of innovative initiatives. The central role of the web in the programme is crucial. In comparison with traditional classroom courses, web-based courses require appropriate changes in the organisation of the course, contacts with students and maintenance. Although much is possible within web-based learning from a technological standpoint, the creation of an active and lively learning community demands extra effort. Care must be taken that too much technology push does not overwhelm the didactic aspects of education. On the other hand, it is important to follow the technology closely and to incorporate this in creative, innovative and useful ways within distance education.

In this article the following two questions are considered:
- What is UNIGIS? This part includes a description of the UNIGIS network, the target group and the teaching strategies employed.
- What are the lessons learned? Attention is focused on the didactic and technical experience related to distance and web-based learning.

Distance learning @ UNIGIS

UNIGIS is an international network of universities co-operating in the design and delivery of part-time distance learning in spatial information management and technology (see also: www.unigis.org). The program was founded in 1990 and the network has expanded into a worldwide group of fifteen institutions and Universities that offer UNIGIS courses on a franchise basis. At present over 1500 professionals from all over the world are following the UNIGIS program. The course is offered in a variety of forms including a one year postgraduate certificate, a two year diploma, or a three year MSc. Common to all these programs is the basic structure of UNIGIS, which is based on a series of complete distance learning packs delivered via the WWW, including course notes, computer exercises, WWW links and reading materials. Member institutions of the UNIGIS network are relatively free to adapt and translate course resources and supplement them with additional materials to support the

needs of local students.

Student profile

UNIGIS students are professionals working in GIS for a wide range of organisations, including central and local government, utilities, consultancy, business, GIS vendors, research and education. They are people who link GIS theory to a whole range of practical applications, such as the monitoring of the movements of elephants in African national parks with the aid of GPS, the development of geographic profiles of rapists for the police, the functionality of water quality monitoring systems etc. The GIS theory is largely the same in each case but the practical aspects vary enormously for each application.

The students are interested in acquiring a broad academic foundation to underpin their knowledge, in the course of which conceptual, technical and organisational aspects of GIS come under discussion. Because of their work and responsibilities they cannot attend conventional courses. They need flexible education that can be followed part-time, and just at those times which are convenient for them. That means that the education must be as free as possible from limitations of time and place.

Learning strategies

The course is based on a set of core units and a choice of elective units to allow the course to be tailored to individual interests. To satisfy the differing needs of students, universities are paying attention to a more flexible and varied education. Globalisation of education and individualisation of study paths make it desirable to be able to construct study programmes on a personal basis with as much flexibility as possible. These new requirements have led UNIGIS into offering different programmes for different students: from short workshops, to certificate, diploma and masters' courses. Also, more differentiation has been built into the study profile. The basic programme of compulsory modules has been reduced, so that students have more opportunity to specialise in a topic of their own choice. So there are different paths for database management, general GIS management, GIS and the environment or a technical exposure to databases and GIS.

The modular framework requires students to download

modules from their local UNIGIS web site and follow them one by one with the help of a tutor available online through email and telephone. Assessment is completely based on course work and the review of tests, reports, and questionnaires provided by the students as a regular part of the learning path. There is no final examination for the diploma, while for the master's degree the local university rules normally apply.

For the largest part of the course students work remotely, but it is common practice to organise a limited number of workshops during the duration of the programme. Workshops have both an educational and a social motivation, providing an opportunity for students and staff to meet and establish a personal relationship otherwise impossible for a distance-learning course. The international community of students is supported by an annual professional updating conference, and web-based discussion lists offer the opportunity to communicate with the worldwide community of UNIGIS staff and students.

Web-based learning: the didactic side

It is noted that ICT offers many interesting technological possibilities for distance learning such as easy access to course material, student support, international knowledge exchange through discussions, as well as possibilities for course organization and administration. On the other hand, the push from technological possibilities like chatboxes, sms, video rooms, game places etc. has sometimes overshadowed the didactic applications. Exploiting all these opportunities and creating a living learning community demands most of all dedication and commitment from both students and tutors.

Experience teaches that distance learning, certainly when combined with the flexible structure of the course, threatens to be a very individual pursuit, and it demands a large measure of self-discipline from the students. Compared with traditional education, students slip more easily into a spiral of study delays. From student evaluations it appears that a stricter guidance from tutors is needed to keep students motivated and to avoid delays. Discussions via the Internet do not arise spontaneously. Tutors must stimulate active discussion, which demands a considerable investment of time by the staff. Language also forms an obstacle for participation in an international forum like the UNIGIS discussion list, where the working language is English.

Web-based learning: the technical side

The introduction of web-based learning leads irrevocably to changes in the course organisation to accommodate the new way of working. The maintenance of a course website requires a considerable investment of time and money. The website must be kept up-to-date with new items to keep the site interesting for students and others. Further, the course material must be regularly reviewed and links to web resources must be continually checked. The web also offers possibilities for the automation of the organisation and administration of the course, such as keeping track of grades awarded, submission of student assignments and the tutors' evaluation of them.

Because the course has developed in stages in the direction of web-centered learning, we have no standard software packet that supports all the necessary functionality. There is great dependence on a small number of technical specialists who keep the local UNIGIS site functioning. There is discussion at present about converting the course to a standard software environment such as 'Blackboard'.

From the student side, having fast access to the Internet is a requirement to enable study of a web-based course. This is not possible in every country. In South Africa, for instance, the course is much less web-oriented because otherwise the number of potential students would be too limited. But even the statistics of the UNIGIS site in Amsterdam show that students often download modules, and work mainly off-line.