

Changes in the geospatial education landscape

A short overview of 20 years in the past and a forecast for the next years

Marinus de Bakker *

Fred Toppen **

* Groningen Centre for Spatial Information; M.de.Bakker@rug.nl

** Faculty of Geosciences, Utrecht University; F.Toppen@geo.uu.nl

Introduction

In order to define the future topics of EUGISES (biannually European GIS Educational seminar) the programme and advisory committee asked from several experts for a vision paper. This paper gives our personal view on what happened during the 20 years we both were active in the GI (educational) community. Also we would like to state our own view in the crystal globe: the future of GI education.

Changes in the geospatial landscape

Recently a good overview on the changes related to GIS (as widely defined as possible) is presented by Cowen (2009). Although it gives a perspective from the USA, most aspects are also applicable to Europe.

Access to terabytes of geographical data, the use of different platforms like cellphones and pda's, and the growth and integration of internet in daily life makes that more and more people are locational aware. Quite probably these people will not be aware that Geoinformation and Geoinformation Systems are at the basis of most of the location based applications and services they use. GIS use and development changed from a specific niche of scientists and "geeks" mostly related to government, to diverse communities involved in IT, innovation and neo-geography and perhaps even more important, the citizen. The one and only GIS expert, famous for solving everything, is now subdivided in a team doing many different GI tasks: user, developer, designer, programmer, consultant, information manager, application manager, But, often GIS work covers only part of the daily activities and is GIS used "just" as a tool. These profound changes influence the geospatial educational landscape.

Changes in the educational landscape

20 years ago the concept of e-learning via internet was not existing. The simplified relationship between lecturer and student was direct, the student supposedly learned what was told. Nowadays the own responsibility and different learning styles influence the delivery modes. The linear direct relation is evolved into a more diverse sometimes project and problem based approach. Learning by doing, by experiments, by real life cases or projects as simulations became more important. This all with less influence and impact of the lecturer: the teacher is transformed into a coach.

Petch (2000) indicated the need for a closer link between business (defined in the widest sense so including government) and education, especially aimed at a similar dynamic lifecycle. Changes in one realm should be followed directly in the other realm. We feel that education in general, partly because of lack in investments and aging lecturers, is not well suited to accommodate these changes.

Changes in the geospatial educational landscape

The changes in how GIS is being taught can be dealt with from several perspectives, such as level of teaching, contents, and modes of cooperation

Level:

20 years ago, the first GIS curricula were taught over the whole world, but that world was limited to university level. Nowadays you can find examples of GI education even at primary schools. On the other end of the spectrum is the growth of GIS courses at a master level. Next to this broadening spectrum of GIS teaching is that also other disciplines add the use of GIS to their curriculum, such as archeology, biology and similar disciplines with only a small but relevant locational element.

Contents

20 years ago the student that would like to study something like GIS was expected to have knowledge and skills related to many aspects, such as collection of data, transformation from paper to digital formats, endless conversions, without almost any standards, fights with non graphical interfaces, slow computers and so on. Nowadays the same type of student can and must make choices, which part of the geospatial landscape he or increasingly she can conquer. As a GI user he can emphasize the applications of GI in almost every direction. Recently more than 110 different domains using GI technologies were mentioned (Scholten et al, 2009). As a developer and programmer the integration with IT developments makes the GI desktop almost obsolete, now that web services are growing rapidly. Managing a GIS in an enterprise or even a global setting demands other type of competences. But some aspects are not changed. The subdivision of the GI workflow is still similar: data collection and input, analysis and output. An overlay in 1990 is still the same in 2010.

Cooperation

20 years ago teaching GIS was very much an individual activity by a single group or even person. Although cooperation was looked for in terms of exchange of teaching materials (exercises, data), real cooperation was rare. Nowadays, joint programmes are more common, at least on the level of master courses (UNIGIS, GIMA, Erasmus/Mundus course in geospatial technologies)

Forecast

The demand for geospatial education can be separated between the user of Geo-information in a specific domain (private as citizen or in a professional capacity), the data manager (collection and maintenance of the data) the Geo-ICT technical expert, and on the top the coordinator (see figure below)

The first large group needs the expertise for data mining and the insight what GI knowledge and skills is needed for their own domains. Spatial Intelligence and fitness for use of the data are the key words in this group.

The second circle describes the data manager. Strong skills in data management, data design and modern techniques like sensor technology should be included in the curriculum.

The third smaller group needs as education a general overview of GI including a specialization related to the different type of job-domains, such as mobile technology, the management of GI, the interface between users and applications, large (sensor and web based) 4D databases.

The line between IT education and GI education will blur, although in practice much is done on the job. Major challenge in this field is to develop educational simulations directed at the communication between the user, data manager and (Geo)- ICT professional.

Last and smallest group is the coordinator. In one way he or she should have an overview of everything, but more specific how to organize a department or organization with a strong GI component. To us it seems that almost every organization needs this expertise.

In smaller organizations these different groups cannot always be separated. Tasks will be diffuse, although some differences will stay. A role as coordinator will often not mix with the technical expert

Major challenge will be to develop a consistent curriculum throughout the different educational levels and life long learning. If pupils will work with GIS early in their educational career, they should be able to go into more depth at e.g. university. And if they need new specific knowledge and skills during their careers and private life, they should easily find and apply this information. Another challenge is the balance between incoming students and availability of educational resources. Some countries have many students, but almost no knowledgeable lecturers, some other countries do have a lack of influx, so educational resources are moved to other topics (e.g. general management or gaming). Also the need for new lecturers is great.

If this all happens according to our view in the crystal globe, the geospatial education landscape will mature, rejuvenate and prosper.

Literature

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