

GIM INTERNATIONAL INTERVIEWS

JOSEPH KERSKI

Shaping Our World

According to top GIS educator and spatial thinker Dr Joseph Kerski, the development and use of geotechnologies is crucial not just as an educational tool, but also in determining the future of the planet. Kerski is education manager at ESRI, the US-based software development and services company that provides GIS software and geodatabase management applications. An enthusiastic geographer - he has three degrees in the subject - he is passionate about studying maps, population, and landform and neighbourhood change, and seeks out educational partnerships, and conducts training in geotechnologies for government, industry, non-profit organisations, higher education, news media, and the public. He creates curricula focused on spatial thinking and geotechnologies into education, and conducts research into the effectiveness and implementation of these technologies in formal and informal educational settings. We spoke to him about GIS education now and in the future.

What are your views on GIM's August interviewee Professor Gottfried Konecny's comments about the professional development of geomatics being impacted by too many educational programmes in Germany? Do you agree or disagree, and why?

When I worked at the US Geological Survey (USGS), at least one student each year from Karlsruhe Polytechnic would choose USGS for their practicum. These students impressed me greatly with their knowledge and skills. More recently, I was invited by ESRI Germany to participate in a GIS summit in Dillingen for educators at secondary and university level, and was impressed by the GIS programmes represented. Germany's GIS education is respected the world over. But I understand Professor Konecny's point; the laws of supply and demand apply to any academic programme, which always has to compete with others in the same country. Compounding the problem today, however, is that programmes compete internationally as well. This affects the number of potential participants across the board.

According to research by Mike Phoenix (former director of ESRI's education Team) over 100,000 students were taking geomatics courses worldwide by 2004. To increase this number, we could consider increasing the number of traditional programmes. However, I challenge the geomatics community to make the expansion of GIS into other disciplines a top priority. We know how valuable spatial analysis is to making decisions and conducting research. We also know that industries, academia, and governments need more employees who can apply geotechnologies and spatial thinking to the issues they face. The problem is that students and professors in most university departments do not realise this. Geomatics professors and research assistants must become a service organisation that actively spreads the technology and methods throughout the campus by providing training and resources to everyone. University departments are like municipalities, and can benefit from GIS technologies in the same administrative ways that municipalities can.

These changes cannot happen overnight, but the professors I met in Dillingen were doing precisely this, with the result that GIS was spreading beyond traditional departmental walls to the rest of the campus. These methods may not bring more students into geomatics programmes, but the end result is that the entire campus, from research to education to administration, will value geomatics so much that the university will simply not be able to function without it.

What impact has the global recession had on the GIS sector?

As GIS expands into more areas of society it is not as susceptible to downturns in one particular industry. The sector has been able to remain strong despite the recession because it is valued and supported by more and more people. The bad news is that organisations are hurting due to the recession having affected so many sectors; not just private industry, but non-profits, higher education and government agencies. Because GIS works behind the scenes, it is easily overlooked. Therefore, investment in GIS software, related hardware, and training become easy line items to delete in times of financial crisis. The global recession forces many GIS professionals to develop marketing skills so that they can point to the value of an organisation's investment in GIS. If they can say, for example, "One million euros invested in GIS in our organisation resulted in an annual savings of 10 million euros through vehicle travel saved, faster retrieval of information, and reduced duplication of services," they have a much better chance of weathering the economic storm. Obtaining reliable specific figures such as these requires the time-consuming development of metrics, but is critical in a world of increased competition for an organisation's money.

How has GIS education in particular been affected?

GIS education has always been affected by economics. The current economic downturn has only served to worsen a pre-existing condition. Educators seeking to use GIS in instruction have always had to face chronically underfunded computer labs, networks, software, and training. On the government and industry side, training is always one of the first things to be cut, despite the plethora of business management books advising against this. The GIS user community believes geomatics to be so valuable that they are often willing to spend vast amounts of their own time and funds to continue learning, even when not supported by their own organisations. On the positive side, training has never been available in so many forms as it is today, and is increasingly even low-cost or free.

What are the best ways to expand the concepts of spatial thinking?

University professors and research assistants could serve as trainers in departments that are not using GIS. Such departments include transport, business marketing, environmental studies, history, mathematics, biology, zoology, and many others. The other way to partner university administrators is to help them obtain and use GIS in campus safety, IT support, building maintenance, traffic, general public events, landscaping, and much more. We also need to ensure that GIS is a part of the teacher education programme on campuses.

Bringing young people into the GIS sector is an ongoing challenge. What needs to be done to address this?

We must not stop at our own campus. We are all aware of the explosion of geospatial thinking in general recreation: hiking, boating, fishing, camping, and much more. We need to work with informal after-school groups and recreational associations to show them the link between their activities and spatial thinking. They need to know why it is important, how it can set them on a lifelong career path, and how they can connect with the wider geospatial community. We must also work with primary and secondary schools to build career connections, offer internships, and serve as mentors. The GeoMentor programme (1) is one way to connect GIS professionals and educators.

How do you believe educators should go about generating enthusiasm for the study of spatial sciences?

A key way to do this is to raise awareness that spatial science has always been a 'green' field. Despite the attention paid to salary, most students say that their top career priority is to have a job in which they can have a positive impact on the planet and its people. Subjects like global sea-level change, earthquakes, or population by neighbourhood in local areas. We also need to get out into the field as often as is practicable.

What are the most pressing issues in GIS education today?

This really cuts to the heart of what the entire GIS education community has been grappling with for the past fifteen years. Public awareness of environmental and spatial issues is at an all-time high; we have geo-enabled many common technologies, with more to come. We are monitoring the Earth as never before, and GIS is rapidly becoming the nervous system of the planet. We therefore have more information at our fingertips, more awareness, and more tools. At the same time, however, urban sprawl, fossil fuel use, deforestation and other practices continue at rates higher than ever. Can we, through GIS education, have a widespread affect on these societal forces?

Secondly, the GIS education community needs to do a better job at working directly with educational policy makers. While in some countries, such as Denmark, this has led to national curriculum changes, elsewhere we have succeeded in working with teachers and professors at local or provincial level, but not at national level. A third issue is the need for research to show how use of GIS affects skills and content knowledge for students in different disciplines. While the GIS education bibliography on 2 contains over 1,100 entries, much more needs to be done, particularly in the area of developing rubrics and metrics that measure the difference made by GIS and that can be replicated and used in other studies. A fourth point refers to Everett Rogers' research into the stages in the diffusion of any innovation. If we are to move beyond the 'Innovator' and 'Early Adopter' stages of the diffusion of GIS through education to reach the 'Early Majority' and 'Late Majority' stages (widespread adoption to the point where GIS makes an impact on all education), we need Web GIS tools that are easy to use yet capable of some core GIS analytical functions.

What lies ahead in the education field?

We will continue to see the development of an international GIS education community. Web 2.0 tools will enable us to collaborate as never before. We will see more cross-level and cross-disciplinary projects that create and share GIS-based curricula, such as iGUESS in Europe and iGETT in the US. We will see the increased power of Web GIS to accomplish some of what we seek to teach in the field of geomatics, but also in the use of GIS as a tool and method within other disciplines. GIS education has not been without its struggles, but it's not too late to effect educational and societal changes.