

GIS adds a fresh dimension to fieldwork

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The reach of GIS is being felt far beyond the geography classroom. Teachers across the curriculum are now using it to bring data to life

For some time geography teachers have been in the know about the benefits in class of GIS (geographical information system) technology. The software uses a mixture of maps, aerial photography, and Ordnance Survey and other data to bring towns, cities and geographies to interactive life. Now interest in GIS is spreading to other subjects.

The problem is that GIS in schools is a pale version of that being used commercially. Plotting corporate marketing campaigns or mapping the local refuse collector's route depends on industrial-strength GIS; what schools use is more GIS-lite. It's easy for students to use but will it have any relevance when they join the workforce?

Bishop Stortford college in Hertfordshire has been taking part in a pilot to assess whether the more complex GIS could be used in schools. Students used GIS coursework in this year's GCSE geography exams, enabling them to carry out detailed analysis using the latest spatial data processing techniques.

The results have been outstanding, says geography teacher Peter O'Conner. "This year 43% of our geography GCSE students gained A* or A grades. An important contribution to these results was pupils' attainment in their project work, where we had more pupils who scored 100% than ever before."

Advanced technology

The pilot was run by the Environmental Systems Research Institute (Esri), using its advanced GIS technology, ArcGIS, and working with Aset, a national vocational programmes body.

Aset had created a GIS A-level module and was trialling it at Kingston University in Surrey. The institute agreed to donate its ArcGIS technology to the first 15 schools that wanted to be involved in the pilot - eight came on board.

"People have done a good job making watered-down GIS," says Roy Laming, the institute's head of marketing and corporate social responsibility. "It's simple to use and in line with the curriculum today. Yet it's not referenced at all in the national curriculum, not even in passing."

He believes the national curriculum has got significantly out of touch with the real use of geography. "Yet every local authority has GIS and every website

with a journey planner has GIS. We estimate there are two million people employed in GIS systems across 30 different industries globally today."

O'Conner says an industry standard GIS is important for educational purposes. It provides a concept of progress, from a year 7 geography student to year 13. It motivates pupils as it's the same system used by M15 and the police, so students can see the relevance in learning to use it. And as it is industry standard, it is compatible with real data sets, such as the 2001 census information. Students can solve real problems and share their results.

O'Connor says that, in the US, schools and colleges are already contributing the work they do to community efforts, working with local councils and the police. "We hope to do the same in a couple of years."

GIS is already used across the curriculum at Leeds grammar school. Mark Smith, head of biology, has been using ArcGIS for a year within biology fieldwork to map a local nature reserve digitally.

"I realised this technology provides a very useful tool for pupils as it raises questions and helps them answer them," he says. "For geographical analysis it's outstandingly good but it goes a lot further. That's what the Esri partnership is about; extending GIS outside geography and creating new resources."

The Broad Street Pump case study is a resource created by Smith and the institute, looking at the spread of disease. It allows students to work out, as Dr John Snow did in 1854, how the spread of microbes transmitted in water caused a cholera outbreak, and where the disease was coming from (a water pump in Broad Street, Soho, London). This is used to teach the germ theory of disease at key stage 3 science.

The school has also been using GIS in history, looking at the spread of Black Death in the 1300s across Europe at key stage 3 up to year 8. In RE, it has been used to learn about the religions of the world and this year at GCSE to look at Jerusalem and the mix of its three faiths.

However, Smith adds that the big problem in using GIS outside the geography curriculum is data. While there is a plethora of maps for geographers, finding data to suit other subjects is sometimes difficult.

Industry-recognised

To tackle the problem, the school has persuaded Yorkshire Water to provide data of the north Leeds sewerage network, which includes the school. It will be used in maths to predict which outfalls and streams will be affected by pollution and where the pollution will go.

At Colchester sixth-form college, GIS is offered for extra study purposes. The school uses the Aset qualification so students can gain a recognised award. Roger Hinds, computing teacher and programme leader for GIS, says one

student, Matthew Hill, did an excellent GIS project last year and, because of his use of the industry-recognised technology, was accepted into his university of choice.

"Matthew got a distinction in his project and when he spoke about it at his university interview, they were very positive about him studying GIS and let him on the course because of it.

"Esri's GIS is the best and most flexible software for teaching I've seen. In industry, you might use a specific GIS for your area, but if you're teaching the theory of it, you want industry standard as it has all the bells and whistles."

Weblinks

Environmental Systems Research Institute (Esri) - GIS in education best practice: www.esriuk.com

Esri - ArcGIS system software: www.esri.com/software/arcgis

GIS in school education: www.abdn.ac.uk/gis_school

Bishops Stortford college - first geography GCSE GIS entries: www.bishops-stortford-college.herts.sch.uk

Royal Ordnance map data - how to access: www.egovmonitor.com/node/583