ICT in secondary geography: a short guide for teachers

Edited by David Mitchell
Introduction

This guide outlines some of the most important ICT available for teaching and learning geography, both in and outside the classroom. Chapters draw on the work of geography teachers and what they find really works. Each chapter takes a separate area of technology and explains, in simple terms, its meaning, why it is helpful for teaching and learning geography, and practical steps to get started, including weblinks to find out more. It is produced by the GA with the support of the RGS-IBG and Becta.

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What is GIS?
Geographical information systems (GIS) are a way of displaying and analysing spatially referenced information. The three main components of geographical information systems are a map, spatially referenced data and software to display the data.

Why use GIS?
Spatial thinking and analysis is fundamental to the study of geography, and spatial analysis is at the heart of GIS. Underpinning the practice of GIS is a widely known family of computer software tools which allow for information to be linked to precise geographical locations and for map information to be converted into digital information. This can assist us in many aspects of daily life and millions of people regularly use GIS to visualise complex facts and improve understanding of hard to comprehend data and information.

Using a GIS speeds up the production of accurate maps and makes displaying data cartographically easier and more efficient. Students can look for patterns and analyse spatial relationships without the mechanics of map drawing; this allows more time to analyse results and increases the potential for higher knowledge attainment.

Many industries depend on GIS tools and it is vital for students entering the workforce to understand the power of a GIS and to know how to represent data on a map in a meaningful way. The importance of teaching students GIS skills as a basic requirement is reflected in its inclusion in the new programme of study for geography at KS3 and in the GCSE and GCE criteria. Mapping News (March 2008) included a CD that introduces the numerous uses of GIS in the world around us. The CD is also available from the Ordnance Survey and the Geographical Association.

GIS in practice
There are plenty of sources of inspiration to be found on the internet. The Geographical Association’s Spatially Speaking project has the aim of finding out how GIS can invigorate the learning and teaching of geography. Go to www.geography.org.uk/projects/spatially speaking for more information.
The Royal Geographical Society with the Institute of British Geographers website (www.rgs.org/gis) has examples and case studies, including video clips of people working in GIS-related industries.

The Ordnance Survey also has a lot of information; their Mapzone site includes plenty of information on the use of GIS tools in the world around us. Go to http://mapzone.ordnancesurvey.co.uk/mapzone/giszone/english/gisreality/page1.html

Another good starting point for finding case studies of how GIS has solved real-world problems is through ESRI’s map museum (www.esri.com/mapmuseum).
Using GIS in the classroom need not be expensive. Google Earth can be used to mark places (placemarks) and add descriptions, videos and photographs to maps. An online demonstration can be found at www.geographyteachingtoday.org.uk/fieldwork/info/teaching-technology/using-google-earth-as-a-tool-for-presenting-fieldwork-data

Next steps

1. Before investing in any GIS software, try using the free internet resources which allow you to view a vast range of data for different geographical purposes. There are numerous websites but some of the most popular are:
   - aerial photography sites (such as Google Earth)
   - census data mapping sites (information for many countries is available, including the UK)
   - local authority/county council websites
   - those mapping specific geographical hazards (such as earthquakes, floods and disease). Use sites such as these to produce creative activities that support your existing plans and give students an additional sense of place, understanding of scale and the opportunity to enquire with a clearly spatial focus. If, for example, you are teaching about a specific place, Google Earth and census maps will both raise many questions and provide answers. Involve the school’s ICT technician from the start to troubleshoot any problems with using the websites in school.

2. If you decide you would like to invest in GIS software, discuss with the school ICT technician which might be most suitable. ArcView, AEGIS and Ulearn are all popular but may not be right for your situation. Teacher reviews of a wide range of GIS software are available at www.rgs.org/OurWork/Schools/Resources/GIS/Software+evaluations.htm. The GA Conference is also a good way to find out more and see what is available.

3. Go on a GIS training course. There are regular courses and events for Google Earth, AEGIS and ArcView. Information about these and others can be found through the RGS-IBG and GA websites (www.rgs.org/WhatsOn and www.geography.org.uk/events).
Internet enquiry: web quests
Ian Dixson

What is a web quest?
A web quest is an enquiry-orientated ICT-based activity in which most of the information is gathered from the internet in a structured manner. By integrating common software applications into the enquiry process, students’ learning can be further enhanced.

Why use web quests?
Web quest lessons have a clear structure that can be differentiated according to student ability. Students enjoy the investigative nature of both highly targeted tasks, such as finding out record temperatures, and more negotiated outcome activities, such as using live web cams and satellite images. In these activities, students can select places to view and interpret. Because web cams are live, students can enjoy the dynamism of having a real-time eye on distant places.

Carefully constructed, a web quest can keep students working within clear lesson objectives, integrating decision-making and problem-solving processes, and also have open-ended activities. Break-out tasks might involve students in group work, which develops social and thinking skills. Well-crafted web quests also have the advantage of meeting the needs of different learning styles; websites can be chosen because they include audio descriptions, animations, video clips, text and/or data sets. The teacher then becomes more of a ‘guide at the side’, assisting students where needed through what is, effectively, supported self-study.

The use of purpose-designed student work booklets can keep each student’s work in one place and reduces print queues to almost zero. Advanced elements of some web quest sites support and integrate student ICT learning skills in addition to developing their geographical knowledge and understanding. Careful choice of websites for use in the classroom can avoid the transitory nature of some URLs and help ensure that those used do not become out of date. Before starting any topic, check the topicality of learning and relevance of the site you are planning to use.

A web quest in practice
The geography department at The High Arcal School has developed a weather and climate web quest for year 7 students. Each student is given a hard copy of learning tasks in a booklet. A ‘soft’ copy is loaded onto the schools’ intranet. The booklet contains a series of structured activities (see Figure 1) into which answers are written.

Lesson 1 What is the weather?
• How are weather elements measured and in what units?
• What are the record weather extremes for Britain?
• Is our weather more or less extreme than world records?
• How does weather affect people?
• Homework: what is your worst ever weather experience?

Lesson 2 What’s the weather like in …?
• What’s the weather like today?
• Skills development – using web cams, satellite images and rainfall animations to describe weather conditions in UK and worldwide

Lesson 3 How do we show climate on a graph?
• What is the difference between weather and climate?
• Skills development – drawing and basic analysis of climate graphs
• How do seasons affect our climate?
• Homework: re-cap seasons in northern hemisphere (plus extension task for Gifted and Talented comparing weather forecast with actual weather)

Lesson 4 Climate, location and adaptation
• Group work producing an A3 poster to explain how plants, animals and people have adapted to tropical rain forest, desert or Arctic climates. Guidance is given on how to search the web, in particular, how to obtain relevant images.

Figure 1: Lesson sequence for year 7 weather and climate web quest.
Hyperlinks in the soft copy take students directly to a targeted website (Figure 2) so that they do not waste time searching randomly for information and are able to follow instructions/answer questions in tandem with the hard copy. Students with lower ability levels have been able to understand most written instructions and succeed best when given additional support in class. All pupils have been encouraged to read written instructions and persevere before seeking assistance. Consolidation of learning and immediate feedback on progress is gained through plenary sessions, not necessarily at the end of the lesson. Homework (also differentiated) has been incorporated into the booklets. The development of a school portal, which students can access from home, will enable further development of the web quest approach in the near future.

A significant feature of a well-designed web quest is the ability to increase the level of interactivity (and by implication higher order thinking skills) encountered by students. Many ICT-based resources claim to be ‘interactive’ yet include only low-level activities with ‘right/wrong’ or ‘true/false’ type responses. Web quests offer the possibility of moving away from these limited learning opportunities to a position where students can source information, process data and feed it back into higher-level learning activities. For example, students can use [www.worldclimate.com](http://www.worldclimate.com) to source climate data and then use Microsoft Excel to create an accurate climate graph. Using supplied labels to annotate the resultant climate graph, they can create a living graph and so extend their interpretative skills and understanding.

Working in groups, students might then use this information to create posters showing how people, animals and plants have adapted to a particular climate, which can form the basis of later discussion and comparison with others who have researched alternative climates. Once set up, the style and content of web quests can easily be adapted to new topics. For example, a key stage 3 web quest may be altered to suit less able learners at key stage 4 or 5. The end of random web surfing is in sight.

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**Lesson 1 What is the weather?**

List 10 different words to describe the weather in the box below.

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How do we measure the weather? Use this web link to help you: [www.bbc.co.uk/weather/weatherwise/activities/weatherstation](http://www.bbc.co.uk/weather/weatherwise/activities/weatherstation)

For each element of the weather listed below give the units of measurement and the name of the instrument used to measure it. Click on the ‘What is …’ link on the right-hand side of the page.

<table>
<thead>
<tr>
<th>Weather element</th>
<th>Units of measurement</th>
<th>Instrument used</th>
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<tbody>
<tr>
<td>Temperature</td>
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<td>Wind</td>
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<td>Sun</td>
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<tr>
<td>Rain and snow</td>
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<td>Humidity</td>
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<tr>
<td>Cloud</td>
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<td>Visibility</td>
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<tr>
<td>Pressure</td>
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</tbody>
</table>

What are the record weather extremes for Britain? Find out here: [www.metoffice.gov.uk/climate/uk/extremes](http://www.metoffice.gov.uk/climate/uk/extremes)

Answer on the lines provided.

Highest temperature? _____________________________________
Lowest temperature?______________________________________
Highest rainfall in 24 hours? ______________________________
Highest amount of sunshine in a month? _____________________
Lowest monthly sunshine? _________________________________

Is our weather more or less extreme than world records? Go to this web link to find out: [www.dandantheweatherman.com/Pikanto/Worldrec.htm](http://www.dandantheweatherman.com/Pikanto/Worldrec.htm)

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![Figure 2: Exemplar page from year 7 weather and climate web quest.](image-url)
Get started with web quests

A quick web search indicates what resources are readily available, for free, online. The weather and climate web quest four lesson sequence took some seven hours to author but, with minor modifications, created lesson resources that lasted several years. Alternatively web quests (GeogITs) can be purchased from Bolt Education (www.bolteducation.com).

The High Arcal School weather and climate web quest can be accessed from www.geography-help.co.uk. Teacher support is on the left hand side. Please feel free to copy, update and modify as needed.
What is a VLE?
A virtual learning environment (VLE) is a ‘place’ on the internet (or on a school’s intranet) where staff and/or students can upload material, such as text, images, video clips, podcasts, etc., for viewing and comment, and where users can form discussion groups and interact with each other and the material on the site. A departmental website is a good example of a VLE.

Why use a departmental website or VLE?
A good departmental website should:

- include useful teaching and learning resources that are organised to support class and homework activities
- provide access to a broad, differentiated range of resources and support to enhance teaching and learning
- encourage and enhance independent learning by providing opportunities for students to take their interests beyond the classroom.

A departmental website or VLE can ensure that geography students have links to suitable international material that is both current and relevant and which will enrich the curriculum. This could include news stories from international media, movie clips, animations, webcams, weather and statistical data, podcasts, science-based blogs, forums and discussion groups set up by other schools studying similar topics. Some sites will have RSS feeds which provide immediacy, whether from a news website filtered to show geographical and environmental news or from the USGS to show the locations of the latest earthquakes around the globe.

If the website contains links to webcams, 360° virtual-reality panoramas, animations and other visually rich materials, this can add dramatic visual interest and excitement to lessons in ways that traditional paper-based resources cannot.
glossaries and database platforms that students can create and control. VLEs like this can organise resources effectively, allow busy teachers to create online and self-marking assessment tasks and encourage increased student participation, interactivity and independent learning.

A good departmental website is also a great marketing tool, raising the profile of the subject and the department. By communicating the content and context of geography teaching and learning, it can also help students, parents and the wider community understand and appreciate the importance and relevance of geography as a subject in today's world.

**A departmental website or VLE in practice**

The range and availability of equipment and computers in your school, and whether or not your students have home internet access, will affect what tasks and content are appropriate to include on your departmental website. Wycombe High School already has a departmental website up and running and the resources listed here are available to be viewed and used by other schools. Before you use your website for teaching, ensure that you have already tested it in school as the internet filtering program might have affected what resources can be viewed.

Start your lesson with visual impact: project a full-screen, 360° panorama onto a whiteboard as your students enter the classroom. Have them write a few questions that are appropriate to the image. One student can rotate, zoom or change the emphasis of the panorama slowly while others ask their questions and supply possible answers. You could also include your own questions building on a previous lesson’s work. A ready-made library of panoramic images is available on the Wycombe High School website.

A website can help you to organise a sequence of resources, links and tasks for use in lessons and to encourage structured, independent learning. For example, an introductory lesson on development can: have task instructions and links to sources of data, such as the CIA World Factsheet or the UN World Database; incorporate links to prepared spreadsheets with a built-in formula for Spearman rank correlation; and have instructions on how to create a scatter graph and how to analyse findings. Other resources could include movie clips, discussion forums, quizzes and feedback forms, and using these will encourage research skills, analysis of ‘live’ data and informed discussion of the findings which can be linked to key questions set by the teacher or by students themselves.

Using the Wycombe High School VLE, students can submit homework assignments online, thus avoiding traditional problems associated with the printing and loss of paper submissions. Marking and grading of work is also done online; students receive feedback in private, and marks and comments are stored for later use, printing or export as needed.

**Getting started**

Before you begin to develop your own website, find out if there is already a website in your school and, if so, determine whether it is possible for your department to gain access to a part of it. Also, check if your school plans to set up a VLE in the near future. When you are ready to begin, involve your students and use their expertise to build in one topic at a time.

**Useful websites**

- **www.whs.bucks.sch.uk**
  The Wycombe High School website and VLE.

- **www.sln.org.uk/geography**
  Staffordshire Learning Network links to school websites, fantastic resources and a forum that is a ‘must’ for all geography teachers.
ICT for geography fieldwork

Dr Eleanor Coulber

Why use new technologies for fieldwork?
Employing exciting and innovative methods for fieldwork opens up a range of opportunities for engaging students in geography. Mobile phones, GIS, GPS, PDAs, podcasts, video media and digital photography can all be used to collect, record, analyse and present data and will undoubtedly enhance students’ learning and increase their interest in fieldwork.

Mobile phone technology
A mobile phone can be used to collect and record fieldwork data without incurring additional costs to the department. Use it for: digital photography and video, recording or listening to commentary on a site (podcasting), texting data back to a central location.
For more ideas: www.geographyteachingtoday.org.uk/images/text/Fieldw_SD_article.pdf

Hand-held computers (PDAs)
Many PDAs now have an integrated GPS that can be used to locate the position of data collection in the field. Used alongside GIS software packages, PDAs constitute a powerful tool for data analysis and mapping. Alone, they provide an exciting alternative to paper-based data recording.
Use it for: land-use mapping, recording data in an Excel spreadsheet for uploading, fieldwork trails or routes, creating virtual landscapes.
For more ideas: www.geographyteachingtoday.org.uk/images/text/FW_GIS_in_fieldwork.pdf

GIS
Schools with access to GIS software packages such as ArcGIS or Infomapper are able to use these programs for the analysis and presentation of fieldwork findings. The functionality of the software is variable.
Use it for: analysis of patterns in collected data, producing high-quality annotated graphs and maps for coursework and projects.
For more ideas:
ArcGIS:
www.geographyteachingtoday.org.uk/fieldwork/info/teaching-technology/using-esri-arcgis
Infomapper:
www.geographyteachingtoday.org.uk/fieldwork/info/teaching-technology/using-infomapper

Free online GIS
A wide variety of websites provide useful free GIS resources for fieldwork. Several of these are mentioned in more detail in the example presented below. They range from the dramatic aerial photography of Google Earth (www.earth.google.com) to the Neighbourhood Statistics website (www.neighbourhood.statistics.gov.uk), which can be used to map 2001 census data for the area of study.
Use it for: introducing the fieldwork site prior to the visit, virtual fieldwork, secondary data collection and mapping, presenting fieldwork findings to the class.
For more ideas:
Putting the ideas into practice

The activity below explores the variability in mobile phone reception across a rural site in Somerset. It is a short investigation that highlights the relevance of geography to everyday issues and students’ lives. The investigation can be carried out in the school grounds, your local area or during a trip to an unfamiliar place.

Primary data collection

1. Prior to the fieldwork, the teacher must first determine the sample area and select accessible sample points along roadsides and footpaths. In this example, a 1km area was chosen with 16 sample points.

2. During the fieldwork investigation, students measure the strength of their mobile phone reception at each sample point, recording the number of bars visible on the phone (Figure 4). Readings can be annotated on a paper map or input onto a digital map of the site using a PDA.

3. On their return to the classroom, students plot isoline maps of their findings, either by hand (Figure 5) or using GIS software (Figure 6).
Secondary data collection

1. One factor that may affect mobile phone reception is the topography of the surrounding land. Students can study contours on an OS map and draw traditional cross-sections by hand. Alternatively, the software package Memory Map (www.memory-map.co.uk) includes 3-D relief maps which can be annotated to identify features and analyse their impact on mobile phone reception (Figure 7).

2. The Ofcom ‘Sitefinder’ website (www.sitefinder.ofcom.org.uk) provides free online GIS in the form of maps that show the location of mobile phone masts in the UK. Masts may have a key influence on the strength of mobile phone reception, and students can add mast sites to their isoline maps to assist with analysis.

3. A further factor worth investigating is the role of population density in determining the site of mobile phone masts, and the resulting strength of reception. The Office for National Statistics’ Neighbourhood Statistics website (www.neighbourhood.statistics.gov.uk)
provides population density maps at a Super Output Area level. More detailed housing density surveys can be carried out using 1:25,000 maps available through the Ordnance Survey’s ‘Get-a-Map’ service (www.ordnancesurvey.co.uk/oswebsite/getamap).

Analysis
Analysis of the findings of this investigation constitutes a visual comparison of the different maps produced, either using acetate overlays or by varying the opacity of layers within a GIS software package. In this case, mobile phone reception was influenced by the one mobile phone mast in the area, sited close to the main concentration of population.

Getting started
For more information about this fieldwork investigation, including ideas for follow-up activities, visit the fieldwork pages of the Action Plan for Geography’s website (www.geographyteachingtoday.org.uk/fieldwork). The website also contains a wide range of resources for other fieldwork studies.

Acknowledgement
Credit for the idea of mapping mobile phone reception goes to Gyles Morris of the Magdalen Project, Somerset (www.themagdalenproject.org.uk).

Figure 7: An annotated 3-D Memory Map of the fieldwork sample area, highlighting topographical features of the surrounding landscape and the impact that these may have on mobile phone reception.
Virtual fieldwork
Jamie Buchanan-Dunlop

What is virtual fieldwork?
Virtual fieldwork is the use of digital media, such as photographs, video, field data and electronic text, digital maps and the internet, to recreate the experience of actual fieldwork on computers in the classroom.

Why use it?
It may be tempting to see the use of virtual fieldwork as an excuse to avoid long trips involving tired, moaning students and soggy sandwiches. However, virtual fieldwork can help students increase and capture the magic of experiencing their environment; it also provides a rich and stimulating alternative when access to particular places is not possible in reality. It has four main advantages:

1. Preparation
With virtual fieldwork, you can show a class or an expedition team a virtual version of the fieldwork that they are about to undertake. For example, you can highlight various features of the environment, or illustrate relevant health and safety issues. In the past, teachers might have collected this information on previous trips.

2. Reflection
Back in the classroom, the creation of virtual fieldwork, based on digital media gathered in the field, can help to focus students on key findings and activities. This deepens their understanding and can prove particularly useful when the fieldwork forms part of a student’s coursework for formal exams. Teachers can highlight particular features that will help pupils achieve higher grades.

3. Sharing
Some school field trips, particularly those involving overseas locations, have restricted availability for students. Virtual fieldwork means that a small number of students can capture and share the experience with the whole school community, extending the reach of the fieldwork by a factor of 100 or more. Fieldwork undertaken by older students can also be shared with younger year groups and those not able to attend important field trips.

4. Creating
Perhaps the most popular use of virtual fieldwork at the moment is the creation of virtual visits to remote and/or hazardous environments that you and your students cannot visit in reality. For example, using digital media that is widely available on the internet, teachers can create tours of the wildlife and habitats of Antarctica, enabling students to explore issues of species interdependence, climate change and scientific practice, without leaving the warmth of their classroom.

Virtual fieldwork in practice
The practice of virtual fieldwork requires an initial gathering of digital media, either in the field or from other sources such as the internet. This media might include field data, images, video footage, audio tracks, texts...
and, for geo-locating your media, latitude and longitude information. The key to creating good virtual fieldwork in the classroom is the gathering of as much relevant information and as many digital images in the field as possible. Ensure that the accurate location of each image and piece of collected data is recorded as you go.

Presenting your data and media
Once you have gathered your digital source material and selected what is relevant to the task, the next step is to choose a platform for displaying and sharing this media. You can use basic presentation software, such as PowerPoint, or interactive whiteboard software to present your data and media (other software platforms include mapping tools like Google Earth, Google and Yahoo Maps, and GIS software like ESRI’s ArcView). Another option is to host all of your media on a website; the easiest and cheapest way to do this at the moment is via the free blogging services provided by Blogger and WordPress.

Case study: Urban land use in Marrakech
On a field trip to Marrakech and High Atlas, fourteen students from Eastbury Comprehensive School investigated land use patterns in different areas of Marrakech. The tools for undertaking their fieldwork included a digital camera, capable of photography and video, and a GPS unit to record the latitude and longitude of particular places.

In the field, the students noted the exact location of different areas using the GPS and then recorded images and observations of each place using digital photography and video. Back in the classroom they used Google Earth to locate their digital research on a map, added additional research sourced on the internet, and then combined this material with the images, footage and information recorded on their trip to produce a virtual field trip ready for sharing.

See http://digitalexplorer.co.uk/google-earth for a link to this resource and other information about using Google Earth to create virtual fieldwork.

E-Base Goes Live: using WordPress, Google Earth and Google Maps
Robert Swan succeeded in being the first man in history to live in Antarctica, relying solely on renewable energy. Every day, using Wordpress (a free blogging software service), he posted live images and video footage of the expedition onto the internet. Searching the internet will provide you with

Updating a website from the Atlas Mountains, Morocco. Photo: © Jamie Buchanan-Dunlop/Digital Explorer CIC.
many websites based on expedition and international fieldwork.

You can use the same methodology as the Antarctica E-Base Goes Live team without leaving the school grounds. Using free services such as Blogger, websites are easy to set up (students are often more than happy to help) and video, images and maps are easy to upload. Once your blog is set up, students can add images, research and live footage on a regular basis.

Getting started with virtual fieldwork

The key to good virtual fieldwork is to gather lots of images and information from your field trips. Make sure the images are digital and that you know where you took them. For the location, you can either use a GPS unit, or a map in highly featured environments.

Web resources

For mapping
Google Earth (http://earth.google.com)
ArcView
(www.esriuk.com/industries/industry.asp?indid=34)
Google Maps (http://maps.google.com)

For web platforms
Wordpress (http://wordpress.com)
Blogger (http://blogger.com)

For examples
Digital Explorer
(http://digitalexplorer.co.uk)
Digital Geography
(http://digitalgeography.co.uk)
Cape Farewell
(http://voyage5.capefarewell.com)

Screenshot from Google Earth of the Marrakech urban land use project. Image: © Google, Europa Technologies, DigitalGlobe, Jamie Buchanan-Dunlop/Digital Explorer CIC.

An interactive whiteboard (IWB) can be the ideal tool to promote higher order thinking and discussion, particularly at key stage 5, through the use of simply prepared resources and student-operated delivery.

**Why use an IWB?**

Within the last decade, IWBs have become increasingly widespread in geography classrooms. Today, they are widely recognised as being incomparable in their potential and scope. IWBs can:

- promote highly stimulating teaching and learning
- stimulate positive class participation
- encourage pace and effective reinforcement
- allow for the efficient review and improvement of teaching resources
- project multi-media resources such as DVDs, websites, PowerPoint files and GIS information.

IWBs can form a central platform to enjoyable, effective lesson delivery. At key stage 5, where more traditional ‘tried and tested’ teaching methods often persist, simple IWB techniques assist students in the analysis of new data; promote interactivity, thinking and communication skills; encourage multiple solution outcomes; and allow teachers to diagnose levels of student knowledge and understanding.

Our case study – a scenario where students need to evaluate the pros and cons of out-of-town retail centres – illustrates an IWB technique involving student manipulation of some pre-prepared text boxes. The technique acts as a stimulus to analysis, evaluation and discussion of outcomes. The exercise is indicative of many sixth form discussion situations, which demand individual, justified, resolutions of potentially contentious problems. As in all such decision-making exercises, an appreciation of contrasting points-of-view, an evaluation of facts and/or statistics and the prioritisation of data will promote a deeper understanding of the issues and provide longer-term recall of the salient arguments for examination at a later stage. Key advantages of using IWBs in the promotion of such discussions are that:

- a high pace can be maintained
- student engagement is encouraged through participation
- review and synthesis of data can be visualised and practised in real time
- multiple solutions can be encouraged and rewarded
- teacher mobility among the student body is an option.

In short, a debate that involves the whole group can be celebrated. Students learn to appreciate that while no one solution is either realistic or expected, a command of the facts and an appreciation of alternative points-of-view is central to being able to make and articulate a convincing decision about a complex issue.

**Interactive whiteboards in practice**

Twenty statements relating to the decentralisation of shops from city centres into peripheral retail and business parks are typed into individual text boxes with a coloured background (Figure 1). Ideally, each statement should constitute only one line of text, with enough blank room left to act as a ‘tag’ when the boxes are ‘stacked’ off the edge of the IWB. The colour of text box backgrounds is irrelevant, but should be consistent.

Note: When projected, the use of either Arial or Comic Sans fonts prove effective for students with dyslexia, dyspraxia and various visual impairments, especially when set against a pastel shaded or ‘sky and clouds’ background.
Type two bold headings on the IWB – pros and cons – to create two sections for the boxes to move into; now, students are ready to operate the board and begin the exercise. One or more students drag a text box into the central space of the IWB for the group to explain, debate, and assign to either the pro or con area of the board (Figure 2). The benefit of student operation is that the teacher is free to move around the group and does not direct the discussion from the front of the room. This ensures better overall participation and a far more stimulating debate. The teacher might only need to guide the discussion forward if it stalls, or provide occasional support to individual students.

If the debate about a particular statement continues for too long, or becomes counter productive, then that particular text box may be colour coded (e.g. highlighting the background in yellow) before being dragged to the side of the IWB for re-evaluation at a later stage. Re-evaluation of contentious statements may take place as the lesson progresses to its conclusion and the key arguments are summarised into, for example, five pro and five con statements. Deleting the clearly discarded statements clears the board for fresh consideration of the ‘debateable’ statements waiting on the side. Once these have been reconsidered and assigned or discarded, conclusions can be agreed upon.

Hard copy lists of the 20 statements may assist students in writing up the exercise. Simply drag all text boxes (in Arial font) onto a fresh page, clear all backgrounds to white, then print, copy and guillotine (Figure 3).

The applications and benefits of this technique are widespread and include extension, homework or other instructions across key stages. After review or departmental sharing, the text boxes are easily edited, updated or refined.

Get started with IWBs
IWBs are a highly effective, dynamic tool. Furthermore, the simplest ideas for incorporating IWBs into teaching are often the most powerful. The following websites illustrate that creativity, not ICT competency, is the most important factor in the development of effective teaching and learning resources.

Web references
www.kented.org.uk/ngfi
For general resources to use on IWBs.

www.prometheanplanet.com
For ActivStudio flipcharts, PowerPoints, weblinks and downloadable teacher resources for all key stages.

www.schoolzone.co.uk
A guide to filtering websites for use on IWBs.
What is an electronic writing frame?
Electronic writing frames are Word documents set up with features to support and encourage users to structure and edit their writing.

Why use electronic writing frames?
Electronic writing frames are, in essence, the same as their paper relatives. However, using the electronic version brings a number of additional advantages.

Electronic writing frames structure and support students’ writing by offering a clear framework from which they can work. The degree and type of support given can be varied to enable levels of differentiation as the electronic frame allows teachers to include as much detail as needed without this information forming part of a student’s final print-out.

Traditional writing frames are very useful but require students to either:
- copy out their work once they have worked on the frame
- use the writing frame alongside their written work and keep checking between the two
- complete and submit their work on the writing frame.

In the first two cases, there is the potential for some students to feel that they are unable to cope, and students can become de-motivated if they have to copy out work into an exercise book or onto paper. In the last case, students may have to submit messy work, especially if their ideas have developed as they worked.

Electronic writing frames can provide a great deal of support while at the same time providing students with an opportunity to complete well edited, well presented work without needing to copy out rough, corrected notes. As such, it is a technique that can help develop student motivation and confidence.

Electronic writing frames in practice
The following technique makes use of Microsoft Word tools.

Start by creating a writing frame in Microsoft Word. This example outlines a piece introducing the geography of crime. Make the support as detailed or broad as necessary, and ensure that a space of a few lines is left between each set of instructions.

Highlight one set of instructions then click on the ‘Format’ menu. Choose ‘Font’ and then select the ‘Hidden’ box. Click ‘OK’. The instructions should be invisible, but this is correct for now. Make sure that you do not highlight the gaps between each set of instructions. Keep highlighting sets of instructions, one at a time, and repeat this.
process with each section that you do not want to see when the work is printed.

Once all sections of text have been highlighted and hidden, click on the ‘Tools’ menu and select ‘Options’.

Click on the ‘View’ tab and select the ‘Hidden text’ in the ‘Formatting marks’ section. Having done this, click ‘OK’ to take you back to the main screen. The text you had previously hidden should be visible again, with a dashed underlining. The file can now be saved ready for later use.
To use the electronic writing frame, students simply open the file and add their answers in the spaces following each set of instructions. Once they have finished writing, students can print out their work; the hidden text and spaces will not print so that the final draft reads like an essay.

Electronic writing frames can also be set up to:
- insert images into the blank text spaces to create an illustrated document
- provide relevant hyperlinked internet addresses in the support text to give students direct access to useful resources.

Get started with electronic writing frames
The best way to start using electronic writing frames is to develop a frame on paper, type it into Word then test it with a small group of students. Further developments can include adding internet links and prompts to include graphs or images to support a student's text. A library of useful writing frame templates could be made available via a departmental website or school virtual learning environment (VLE) for staff and student use.
Using images in the geography classroom

Tony Cassidy

Images are the most valuable resource in a geography teacher’s toolbox. Images stimulate the senses of students and open up their imaginations to new environments. Using images in the classroom can challenge students’ internalised representations of place (often stereotypical), which can lead to deeper and more critical thinking about places and their representation.

Using images in the geography classroom

The simplest method of incorporating images into teaching is to project them during a talk or discussion. Images stimulate the visual intelligence of students: distant places and landforms can actually be seen; images can generate a sense of awe and wonder for the built and natural environment; and students’ internal visual representations of a place or landform can be compared to, or challenged by, the externally visual. Photographic images can provide a snapshot of a place in time, which can lead to questions about the perspective and motive of the subject’s photographer.

Images in practice

A humanistic approach to landscapes

This exercise is designed to develop students’ appreciation and creative interest when introducing a new landscape-based topic into the classroom. Using PowerPoint (or a similar software package), set up a slideshow of images. Add a reflective soundtrack, such as a piece of classical music, then ask students to record their emotional response as they watch and listen to the presentation. Later, these recordings can be used as the basis for producing a piece of creative writing or a poem.
Talking heads
Collect a selection of images of people and place them into PowerPoint, adding thought bubbles to each person’s head. Projecting the images in the classroom, discuss who the people might be, where they live, what they might be thinking, etc. By using contrasting images, students can compare and contrast different social and cultural contexts.

Odd one out
Choose three images, two of the same place and one of somewhere else. Insert all three into a single PowerPoint slide so that they can be projected at the same time. Discuss which image is out of place and why. This is an effective exercise for challenging internalised stereotypes.

Sensory images
Using a simple photo-editing package, bring images of places or environments to life by inserting photographs of students. Ask them to imagine what they would see, hear, feel, touch, smell and taste if they were really standing in this place. How would their lives be different in this place?

Get started with images
Invest in a digital camera and keep it with you – even the most mundane looking objects can have geographical significance and you never know when you’ll see something interesting.

Web resources
www.flickr.com
Accounts are free and you can upload your images to share with other geography teachers. Search: groups, geography. Some images are available under Creative Commons license.

www.geographyphotos.com
This site requires a departmental subscription but has an excellent range of curriculum-related images.
What is movie making?
Movie-making involves using ICT tools such as PowerPoint to edit digital video clips into a meaningful story. Movie-making can involve working with digital content sourced on the internet (of places that students may not be able to access themselves), the editing of their own footage made in the field, or a combination of the two.

Why use movie making?
Video is one of the best ways of providing students with a detailed impression of what a place is like, short of first-hand experience. By undergoing the processes of planning, producing and even publishing a movie themselves, students (and teachers) benefit enormously from having to put themselves in the position of a geographer in order to tell a meaningful story in film. This kind of experiential learning does not happen when students merely watch movies produced by other people. The process of enquiry, analysis, production, presentation and reflection pushes students to ask relevant geographical questions about the subject matter, to communicate their knowledge and understanding in clear, concise and engaging ways and to develop their sense of place and an awareness of geographical processes.

Movie making in practice
Movie making can be used to create virtual transects, the name given to a form of film which involves travelling a particular route and stopping at selected locations to film for at least 30 seconds in each compass direction, before walking to the next
location. Back in the studio or classroom, this field footage can be used in a huge variety of ways and, once selected and edited, can be presented on maps and even navigated from within PowerPoint.

Making a virtual transect
The process of making a virtual transect is simple and can be varied according to your needs. I made one for my department by walking across central London and another for an educational publisher by walking along the South Dorset coast. To produce a virtual transect:

1. Choose your route
2. Decide how often you are going to stop and film. This could be based on a basic sampling technique
3. Walk the route, remembering to stop and film in each direction at each chosen location
4. Capture the video to your computer and save the footage of each direction at each location as a separate video clip
5. Back in the classroom, insert each video clip into a separate PowerPoint slide. By creating a text box with a hyperlink to a chosen slide, you can create buttons to navigate between the different slides.

Using virtual transects
As teaching tools in geography, the significant feature of virtual transects is their capacity to express narrative in spatial, as well as linear, terms. In a virtual transect, time is not the major concept underpinning the story of the subject; the clips do not have to progress in chronological order. Instead, the producer and/or viewer of the footage can select the sequence of clips to allow for a narrative that is focused on place. This sequence can be changed many
times to support numerous lines of query.

Once you have produced your virtual transect, students can order or re-order the information, classify, prioritise, compare, sequence, link, label, map, find, present, story-tell, or even script the clips according to issues relating to any of the seven national curriculum concepts. For example:

**Place:** Ask students to rank each location from the most to the least safe place. Discuss the difference in ranking of views to the north and south taken in the same place.

**Space:** Mix all the slides up and ask students to place them in the correct geographical sequence (from the start of the journey to the end). Have students try to identify flows or patterns between views to suggest how they might be connected.

**Interdependence:** Ask students to find slides that show evidence of a particular place that is dependent on other places. After identifying a number of slides containing evidence, ask students to write a narrative that explains these links. This narrative should be recorded or read out loud in conjunction with the visuals.

**Web resources**

http://earth.google.com
Locate virtual transect points

http://neighbourhood.statistics.gov.uk
For demographic data on postcode areas

www.ggip.co.uk
London virtual transect

www.streetmap.co.uk
Look up postcode locations
Blogging

Alan Parkinson

What is blogging?
The use of a website to post a diary or commentary and to create a forum for ongoing discussion and debate.

Why use blogging?
Free blogging platforms allow for immediacy, collaboration and positive feedback between students, teachers, other schools and relevant groups. They are easy to use and have become widespread. Comments, images or text are published on the site in chronological order so that the most recent additions are always at the top of the page. Blogs allow teachers to create a web presence without the need for complex or expensive software and they provide another opportunity for teachers and students to develop their digital literacy.

Blogging can be used to:
• provide a central point of contact for students to refer to after the lesson is over
• prepare students for a fieldwork experience and assist them with post-fieldwork reflection
• showcase student work to global audiences, possibly for peer-assessment or comment, and model best practice
• support students in revision for examinations
• aid teachers’ professional development by providing opportunities to reflect on units of work and read the thoughts of other teachers undertaking similar work
• collaborate with other teachers and share the load of keeping up with curriculum changes and new developments
• inform colleagues of notable websites, documents, TV programmes or newspaper articles
• maintain links between schools and for cross-phase collaboration
• pursue a specialist niche, such as schemes of work or images.

Blogging in practice: four case studies

1. Developing a new GCSE course
Blogging allowed geography teachers developing new GCSE courses to ask questions and pass comments between different schools. Approaches to administration, coursework assistance and general lesson resources were shared and the pros and cons of different methods discussed. Compare the approaches taken by two schools to the introduction and delivery of the pilot GCSE course on these blogs:
http://pilotgcseradicalgeography.co.uk and http://kespilotgeography.blogspot.com

2. Building motivation, anticipation and enquiry before a field trip
Prior to their fieldtrip to Iceland, students from the High School of Dundee were able to access a blog set up by their teacher, Val Vannet, to browse images, ask questions and leave comments in preparation for their trip. The provision of high-quality images and accurate information helped students to develop a basic level of geographical knowledge of the place they were going to visit, and by supporting their imagined sense
of place, the blog was able to fuel their enquiring minds and make the actual trip a more rewarding experience. You can see Val’s blog at http://hsdiceland.blogspot.com

3. Supporting international school links
A blog set up by Tom Biebrach at Pencoed School in Bridgend provided a link with the school’s African partner school in Kabundi, Zambia. The blog allowed pupils from both schools to view, discuss and question a number of videos and images made on reciprocal visits between the schools. Important discussions about issues such as HIV/AIDS were also explored and developed. The blog can be viewed at http://pencoedkabundilink.wordpress.com

4. Sharing creative ideas
The ODBLOG (http://geodonn.blogspot.com) is a good exploration of a geography teacher from Glasgow’s emerging pedagogy and refreshing teaching ideas and resources. It also contains some interesting and inspiring discussions of interest to many geography teachers.

Keeping up with blogs of particular interest can be made easier if you register for a subscription. When you visit a blog, look for the RSS logo in the address bar. Click on the logo to see details of the latest posts for that blog; you can then subscribe and will be sent the latest postings to that blog. Google Reader is one way of viewing these feeds (www.google.com/reader/view).

Get started with blogging
Blogging is easy to start. There are several free-to-use blogging platforms including Blogger (www.blogger.com) and WordPress (www.wordpress.com). Both offer fast set up and a choice of domain name for your blog. John Barlow from Liverpool has produced an excellent booklet for users of the Blogger platform, which can be downloaded for free at www.geographypages.co.uk/johnbarlow.pdf. For a free guide on setting up a WordPress blog go to www.swict.com/wordpresscourse.asp

Sites such as Slideshare (www.slideshare.net), Flickr (www.flickr.com) and Scribd (www.scribd.com) allow content such as images, text and video to be embedded into blogs for easier sharing.

Further reading


Links and other information
www.geographypages.co.uk/blogpages.htm
Provides an extensive listing of geographically-related blogs, plus other interesting blog-related material.
This guide outlines some of the most important ICT available for teaching and learning geography, both in and outside the classroom. Chapters draw on the work of geography teachers and what they find really works. Each chapter takes a separate area of technology and explains, in simple terms, its meaning, why it is helpful for teaching and learning geography, and practical steps to get started, including weblinks to find out more.

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