GTIP Think Piece –Maps and atlases (Patrick Wiegand)

Patrick Wiegand (University of Leeds) discusses research into students' misunderstandings of atlas maps. He suggests a range of school and university based activities for PGCE students to encourage them to use atlases and digital cartography more effectively.

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Introduction
Atlases are essential reference tools. Whether conventional or digital they capture the essence of geography more than any other resource. They are bought by schools in large numbers and therefore represent a considerable financial investment. Yet they appear to be used relatively infrequently and, when they are, their use can be limited to finding the location of places. Thematic maps and higher order map skills often appear to be neglected.

Geography teachers can sometimes assume that the use of atlas maps is unproblematic for learners and little classroom time may be spent considering how small scale maps represent information. Students frequently have misconceptions about what the maps show – and what they don't. Atlas maps require a different type of thinking to that needed for large scale maps and plans. Maps of countries, continents and the world represent areas of the Earth's surface that are too large to be looked down on from above. Consequently, abstraction plays a greater part in map reading and interpretation.

A useful summary of how maps work, key concepts in map learning and teaching, research evidence for school students' thinking with maps and many illustrations can be found in Learning and Teaching with Maps by Patrick Wiegand (Routledge, 2006).

Key questions
- How are atlases used in geography classrooms? Could they be used more effectively?
- What common misunderstandings do school students have about how small scale maps work? How can teachers address these misunderstandings?
- What new learning and teaching strategies are required by digital cartography?

Student thinking with atlas maps
We have relatively little hard evidence for secondary school students' thinking with atlas maps and that which exists is somewhat patchy, mostly rather dated and not always very reliable. Most of the work that has been done related to conventional atlas mapping: we know even less about school students' use of digital cartography.
It is important for PGCE students to be aware of what we know from research about student thinking with atlas maps. Read the article (and reference list) below for more on this topic: Student Thinking with Atlas Maps (60k)

Of course, not all school students make the errors described in the article, but geography teachers need to carefully check the understandings and misconceptions that students bring to their use of atlas maps. The activities suggested below are intended to help trainee teachers

- review the extent and nature of atlas provision in school
- check for student understanding of some aspects of small scale maps
- develop some helpful strategies for teaching with atlas maps

Remember that the aim is not to avoid the use of small-scale maps because there are common misconceptions about how they work, but to anticipate potential student misunderstanding. Map interpretation is as much about what the user brings to the map as it is about how the cartographer has represented the information (MacEachren, 1995).

PGCE Activities
The activities suggested here are presented in two, loosely defined categories: activities that might be carried out in school (perhaps as part of an assessed school-based task); and activities that might be carried out in the university based part of the training. The full set of activities is available here as a single Word document, while individual activity downloads with brief descriptions are provided below. PGCE Activities - Complete Set (83k)

A. School-based activities during the PGCE year
These activities are most effective if each of the trainees in a PGCE group collects data that can be shared later with the rest of the group. Trainers should help trainees identify the diversity of resources and practice as well as commonalities between different school contexts.

1. Atlas Report: Locate the atlas stock in your placement school. Include both conventional (paper) atlases and atlases on CD ROM. Together with other trainees, devise a simple recording proforma to collect information. Write a brief summary statement about the atlas supply situation derived from the evidence obtained by your group.
   Activity: Atlas Report (51k)

2. Atlas Use: Observe a number of geography lessons in your partner school and/or talk to geography teachers about the use they make of atlases.
   Activity: Atlas Use (48k)

3. Explore Students' Understanding of Atlas Maps: Work with a group of school students at Key Stage 3. Choose a small selection of atlas maps (no more than four) and investigate the students' understanding of them.
   Activity: Explore Students' Understanding of Atlas Maps (46k)

B. Activities for HE-based PGCE sessions
Trainees will need access to some school atlases in order to carry out these activities. This doesn't have to be a class set of the same atlas and, in fact, there is some merit in having a selection available.
1. **Using Atlases for Starter Activities:** Choose an atlas map that would be relevant for a place, a theme or an issue you are going to teach about. Prepare an introductory question and answer sequence for this map for the first 10-15 minutes of the lesson. In addition to framing your questions, you also need to make a note of the answers you expect.

   Activity: [Using Atlases for Starter Activities](50k)

2. **Explaining Text - a Short Starter Activity:** Choose a topographic (general reference) map from the atlas that shows a place you are going to teach about. Prepare a short introductory explanation about how the text labels on the map work.

   Activity: [Explaining Text - a Short Starter Activity](50k)

3. **Planning a Map Skill Lesson:** Plan a lesson for Year 7. You are going to teach students how to look up places in their atlas.

   Activity: [Planning a Map Skill Lesson](52k)

4. **New Skills with Electronic Atlases:** Use an electronic atlas (either CD or online). You are going to consider what knowledge and skills students must have before they can make best use of this resource.

   Activity: [New Skills with Electronic Atlases](50k)

**Links**

**Key secondary school atlas publishers:**
- Oxford Education

**Online maps and atlases:**
- Atlapedia
- Bing Maps
- Mapquest
- National Geographic Map Machine

**See also the following sites:**
- National Atlas of Canada
- National Atlas of the USA

**GIS:**
The boundary between GIS and more conventional mapping is blurred. Check out the following sites which contain links to GIS resources:
- Ordnance Survey
- ESRI

**Other sites:**
- Google Earth - outstanding source of satellite imagery, maps and 3D graphics
- The Degree Confluence Project - a fascinating site that can be used in conjunction with atlas work
- Worldmapper - a collection of maps where territories are re-sized according to the map topic
References


A list of references related to student thinking with atlas maps appears at the end of the article *Student Thinking with Atlas Maps*.

Journal Abstracts