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Maps We Can All Understand: The role of research in primary school atlas design

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*He had bought a large map representing the sea,
Without the least vestige of land
And the crew were much pleased when they found it to be
A map they could all understand.*
(From the Hunting of the Snark by Lewis Carol)

By the time they start primary school children are already aware of the wider world and will have started to form their ideas about places beyond their direct experience. They will know that there are creatures such as tigers, whales and polar bears which live in different global habitats. They will have seen pictures of distant places on TV, films and electronic media and heard of other countries, perhaps through major news events or sporting connections. Some will have travelled abroad for holidays or to visit relatives. Others will have learnt about journeys to unusual places in picture books and stories. As children grow older and embark on their first years of schooling, their ideas about the world continue to develop. The information which they receive comes from many sources but maps and atlases will undoubtedly be one of the key influences that will shape their images.

What is a school atlas?

School atlases serve contradictory purposes. Traditionally they have been seen as providing spatial information about the location of places and different environments around the world. This function positions them as authoritative and comprehensive reference sources along with encyclopaedias and dictionaries. However, school atlases also have a role in supporting teaching and learning, particularly in geography. As such they need to appeal to pupils imaginatively and provide the creative space that will stimulate their thinking. The tension between these different approaches poses a challenge for atlas authors. They have to strike a balance presenting a single, uncontested account of the world which is closed and precise with a much more open approach which acknowledges multiple and contested realities.

Pupils' world map knowledge

What do primary school pupils know about the world and how do they build up their knowledge and understanding? One of the most significant areas of study concerns children's growing understanding of the world map. Research by Wiegand (1995) into English primary school children's free-recall map of the world suggests that there are a number of distinct stages. The most basic representations may simply consist of isolated and disconnected shapes representing places as varied as local towns, countries, the North Pole or places featured in stories. In the second stage territories begin to be differentiated by size and in the third sub-divided into areas. In the final stages the territories become increasingly recognisable and their distribution is increasingly accurate. Lowes (2008) has reported a broadly similar sequence in more recent research but notes that in the interim stages children either tend to draw land masses floating in the sea (island maps) or clinging to the frame (edge maps). The most sophisticated and recognisable maps also exhibit a tendency towards symmetry and alignment of land masses – something which has also been noted in adult responses

Atlas maps present many challenges for young children. Language is one of them. As they scan different maps they will come across unfamiliar place names derived from foreign languages and have to cope with

linguistic 'false friends' such as the 'Alice Springs' in Australia or 'Salt Lake City' in the USA which suggest physical features but are really settlements. They will also need to understand broad concepts such as 'climate' rather than more specific terms such as 'sun', 'wind' and 'rain'. Insecure readers who are used to decoding text arranged in neat lines from left to right may find the labels which are scattered across the page in various sizes of type particularly hard to decode. Abbreviations present further difficulties as do homonyms (words which sound the same but have different spellings and meanings eg 'more' and 'moor'). When it comes to reading an atlas key which is graded by different shades or colours, pupils who have a well-developed colour vocabulary will be at an advantage to those who are unable to name or describe the colours that they see.

Scale and symbols can be equally problematic. In order to show continents or large land areas, atlas maps are necessarily drawn to very small scales and involve considerable generalisations. Children who can make sense of maps of their local area which they have explored on foot and visited repeatedly have no such support when they are presented with a map of the world. Indeed, in order to interpret what they see they have to bring additional knowledge and understanding to bear if they are to interpret cartographic conventions. To help young children understand ideas which are beyond their direct experience, atlas publishers sometimes use drawings on maps instead of abstract symbols. However, it appears these are not always readily understood. Wiegand and Steil (1996), for example, found in their research with 86 primary school pupils that in one picture atlas a car symbol, which was intended to represent car manufacture, was variously interpreted more prosaically as a 'car park', 'traffic jam', a 'breakdown' or simply a 'place where people like cars'.

The notion of a country raises further complications. Not only are countries socio-political constructs, but they are also part of a hierarchy in which smaller units such as towns and regions are nested within larger units such as countries and continents. It was research by Piaget (1928) that first alerted educationalists to the complexities of nested hierarchies. Subsequent researchers such as Jahoda (1963), Harwood and McShane (1996) and Lowes (2008) confirm that pupils as old as ten or eleven commonly experience difficulties with the concept of a country and see the components of their address as isolated units rather than as components within a unifying structure.

It is possible that the middle years of childhood might be a particularly favourable time to teach children about other countries. At this age pupils have progressed beyond the ego-centric thinking of their infant years but have not yet entered the self-centred modes that characterise adolescence. As they begin to develop interests beyond their home and family and assert their independence, finding out about other parts of the world chimes with their needs. When they move beyond the primary school increasing attitudinal rigidity make stereotypes harder to dislodge and a downward curve in international and inter-racial goodwill may serve to limit their interests (Scoffham 1999).

Age is just one of the factors which need to be taken into account when exploring children's ideas about countries and national groups. Barrett (2007) presents a comprehensive review of research into children's ideas conducted over many decades and draws attention to other key influences such as gender, culture, ethnicity, social class, personal experience, overseas travel and character traits. He also highlights how children's thinking is often associated with strong emotions which sometimes develop before they acquire any factual knowledge or understandings. Such findings are important for educationalists as they suggest a complicated interaction between cognition and affect. Simply learning about another country is not necessarily going to change how pupils feel about it.

Planning a school atlas

One of the main functions of an atlas as far as schools are concerned is to support the curriculum. In the UK, the National Curriculum has always made specific mention of atlases and locational knowledge. Despite these requirements there is good evidence that pupils' knowledge remains poor and that teachers are failing to contextualise studies. For example, Ofsted (2011) found that secondary school pupils were 'spatially naïve' (para 36) whilst primary pupils had 'exceptionally weak' knowledge of places (para 10). Such failings are not confined to the UK. In a study involving ten year olds from different European

countries, Schmeinck (2005) discovered that only around half of Swiss children and a third of Germans were able to locate their own country correctly on an outline map.

As well as keeping abreast of curriculum developments, school atlases need to be informed by the latest academic thinking. Traditional approaches to geography which tended to favour clear cut descriptions and linear analysis have been replaced by multiple perspectives which recognise that knowledge is both contingent and contested. There has also been increasing interest in humanistic approaches and emotional responses to place. Bonnett (2008) makes the point that modern geography contributes to our understanding of many of the big issues that beset the world today, particularly in relation to the environment and international understanding. Meanwhile Lambert (2011), coming from an educational perspective, contends that geography needs to adopt a 'capabilities' approach which will help pupils to become competent and self-fulfilled individuals.

The dramatic advances in technology have also had a considerable impact on geographical enquiry. Pupils now have access to electronic maps and on-line school atlases which they can modify and manipulate to show different variables. The opportunities for pupils to identify patterns and interconnections relating to a particular line of enquiry has also been greatly enhanced. At the same time, the range of cartographic material which they can access has multiplied. Flexibility and the ability to respond to change are key features of digitised data. Electronic maps can be regularly updated while print materials tend to date. These trends look set to continue and they are having a huge impact on both the way that maps are compiled and the information that they portray. The view of the world which we carry in our heads – our geographical imaginations – is evolving as a result. For a social geographer such as Danny Dorling the potential for maps to show human rather than physical data is enormous. As he puts it:

When I look at a 'normal' map today I see a strange map. I see a map about places where people almost always don't live. I see almost all human life squeezed into a tiny part of the paper or screen... On our screens, on our phones, in our textbooks and magazines, our images of the world are changing faster than the world itself. This is because we are rapidly evolving and to think collectively, differently, to visualise better and to accept less meekly.

(Dorling 2012 p98)

Gateways to knowledge

Maps are powerful resources which mediate our images of the world and are key gateways to geographical knowledge. They carry messages about what we value and what we think matters. As they study an atlas, children can be transported imaginatively to places around the world. This engagement can be a significant life experience. Research by Catling et al. (2010) into the motivations of primary teacher educators has found that fifty per cent of respondents identified the love of maps which they developed in childhood as a key influence in their careers; ten per cent specifically mentioned atlases.

Maps are also contentious. Questions to do with colonial relations, global inequalities and the future of the environment will inevitably emerge from any meaningful reading of the 'texts' which atlas maps provide. What is left out can also be highly significant – gaps and silences often reveal ideological bias.

Furthermore, the neatness and order which is shown in an atlas is often not reflected in what actually happens on the ground. For example, national boundaries are sometimes hotly disputed especially in some parts of Africa and the Asia but portrayed in most maps and atlases as static and defined. The population of cities and statistics about many aspects of human welfare are open to question. As pupils develop a framework for new knowledge they need to be alerted to such issues. The narrative which an atlas presents is necessarily bounded by culture and time. It is a particular view from a particular place which, as Kent and Vujakovic (2012) remind us, will also be underpinned on an ethical level by a set of values and beliefs. It only seems honest to acknowledge these foundations and to recognise the hidden influence of ideology, power and politics. The alternative is to opt for a what Adiche (2007) calls a 'single story' which can be both misleading and disingenuous.

Conclusion

Devising a school atlas involves making compromises. There are hard choices relating to page design, the use of photographs, charts and diagrams and the way they can be used to complement each other. The budget which has been allocated and the availability of information may provide limitations. The requirements of the curriculum and the practicalities of classroom use act as further restraints. On a more fundamental level, the tension between the dual functions of promoting flexible learning and definitive locational knowledge provides a further challenge for atlas authors.

Despite these developments, print atlases seem set to continue to have an educational role for the foreseeable future. They provide a clear global and regional framework for new knowledge which is invaluable for new learners and which supports more mature understanding. They also bring together a range of carefully graded and selected material in a single trusted publication on curriculum-related themes and topics. As Widdowson and Lambert (2006) put it, textbooks and print materials in general are part of the 'resource ecology' of the classroom and have an important role to play in the contributing to the networks that support learning. There are plenty of opportunities for printed publications and electronic data to complement rather than compete with each other. And there are many imaginative ways that schools and teachers can use an atlas to develop and extend their locational knowledge, however weak it might be. As an entry point to learning about the world and as a resource which pupils revisit in different ways during their studies, school atlases deserve to remain highly prized resources which are not only valued but treasured.

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