Developing Holistic Thinking

Phil Wood shows the potential of mind maps in identifying links between geographical phenomena, and how students can develop a more holistic way of thinking by learning to link what they study in different modules in geography.

The National Curriculum and examination-based syllabi in geography have for a very long time stressed the subject content which students have to cover. As a consequence, students are often taught through the use of a number of content-based 'modules', such as those focusing on rivers, urban processes or natural hazards. This is obviously a convenient way of parcelling the subject, and allows for a clear focus both in learning and also in organising a curriculum. However, one negative by-product of this approach is that students often develop a view of the subject which sees each area of knowledge and understanding as somehow separate from the others. Presented with a stimulus, they are able to dissect the information presented but often can only attend to one focus at a time. Another issue concerning this way of forming the curriculum is that students can begin to see the learning of content and concepts as linear and sequential, rather than appreciating that areas of knowledge are inter-connective and complex.

The tendency to pigeon-hole ideas and content has become very apparent by the time students have reached A-level. This can be exacerbated by the modular nature of the A-level, where modules are taught in isolated units, and by the examination system, with disaggregated modular exams which can be taken at staged points over a two-year period. This can reinforce the 'sealed' module mentality within the students' thinking and view of the subject. However, with the introduction of synoptic assessment in 2000, there is a need for students to be able to range across modular boundaries and make sense of a wider conceptualisation of the subject.

Using imagery – developing holistic thinking at A2

One way of developing a holistic capacity in the subject is to use imagery and mind mapping to allow students to consider the essential connectivity of the subject.

The use of mind maps and concept maps already has a strong currency in geography education. Leat and Chandler (1996) give a clear methodology and rationale for using visual and meaningful techniques in the geography classroom, while O'Brien demonstrates how concept mapping can be used as a form of writing frame to help order student thinking:

> *'Concept maps are visual maps of connections between different and often disparate ideas. They enable students to see connections between existing ideas, to connect new ideas to prior knowledge and to organise their ideas in a structure that suits them'* (O'Brien, 2002).

The technique employed with a group of upper-sixth students involved the use of an image as a starting point. In this context, the end point was a mind map as opposed to a concept map, but the essential thinking process which underpins their work is the same. The image in Figure 1 shows a rural setting in the East Midlands, but other images were used from a variety of settings – on occasion images which did not necessarily have a direct link to content covered in the course, e.g. glaciers.

Students were asked to annotate the image with the things they could see or infer from the photo. It was stressed that nothing should be seen as too mundane or unimportant. The students were given approximately five minutes to complete this part of the exercise. This was done to allow them opportunity to deconstruct the content of the image, and as a consequence to begin to understand both the constituent parts and how they might fit together.

Having done this, students were then asked to create a mind map which linked as many elements of the subject as they could to each other and the picture. They were given about 10 minutes to do this. The example in Figure 2 shows how the students began to link disparate areas of the subject together. Farming is linked to soils and eutrophication, and the presence of people is eventually linked to global trade. As the students got used to the technique and medium, they started to involve more and more of the subject in their mind maps.

This technique was used ten times over the course of the year, and towards the end of this period, two students were interviewed to gain their thoughts on the exercises they had completed and their subsequent reactions to the pre-release material for their synoptic examination. When they were asked if

Figure 1: Little Dalby, a hamlet in East Leicestershire. Photo: Phil Wood.

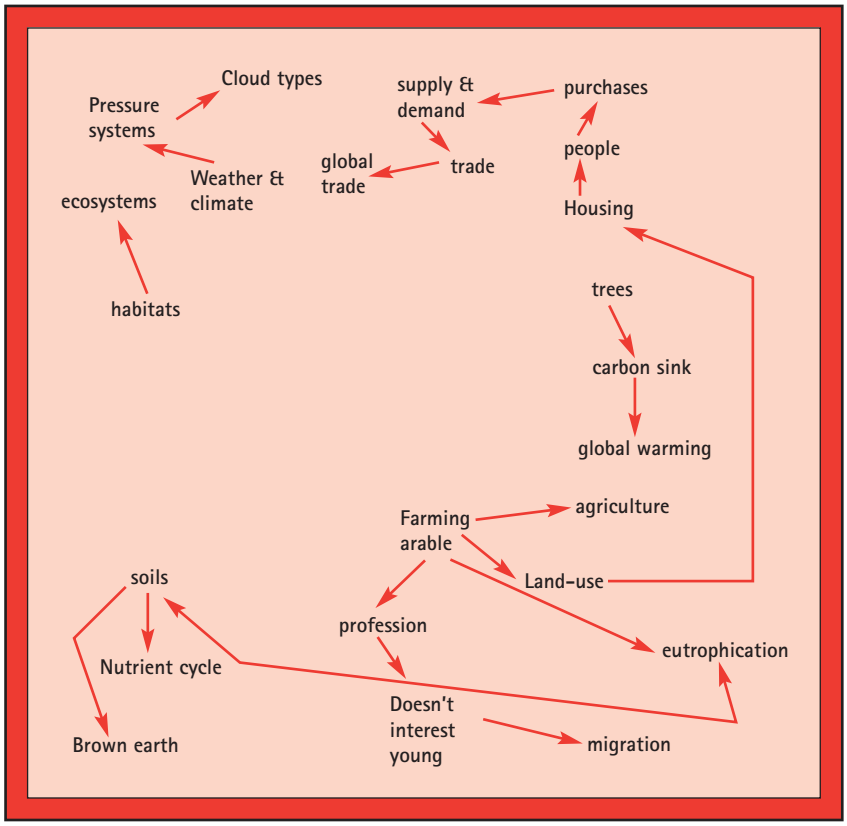

Figure 2: Example of student response.

they believed the exercises had helped their understanding of the subject, one student replied:

> *'Yes, because it makes you think like that more often, not just when we've got a photo in front of us. When we're being asked questions you can ... I don't know ... delve from one thing to another, to another ... And it's not just in geography, it has helped in my other subjects as well'.*

When they were asked if they felt that the approach, used to deconstruct and summarise the information in the synoptic assessment pre-release material, had helped, the other student replied: 'It made it obvious. It was obvious when we got the resources about how they fit together'.

Hence, even though the technique itself is a very simple one, taking up little curriculum time, it does highlight and develop in students a much clearer understanding of the holistic nature of the subject. Indeed, there is no reason why this technique could not be used in either key stage 3 or 4, where it could very much take on the features of a game.

Holistic thinking and prior learning – starting coasts with year 10

Another way of using this technique is to substitute the use of a single image for a range of materials, such as videos, text and again images. A group of year 10 students were starting an extended unit of work on coasts as part of the optional units of the Pilot GCSE (Wood, 2004). Given their prior learning about coasts at key stage 3, and the range of experiences this would have brought, the use of a mind map was made to gauge understanding and at the same time give the students an early holistic overview of the subject content. Students were given a short introductory piece of writing on coastal environments, and were asked to read through it, underlining any words or phrases they felt were important in studying coastal environments. Once they had done this, they were given a small number of photos and one key stage 3 and one key stage 4 textbook. With these resources, they were then asked to create a mind map which connected together the words and phrases they had underlined. Importantly, they were asked to include a 'lost concepts box' at the base of the page. They were told to include any words they did not understand in this box, and were told they would be dealt with later. An example of the resultant mind maps is shown in Figure 3.

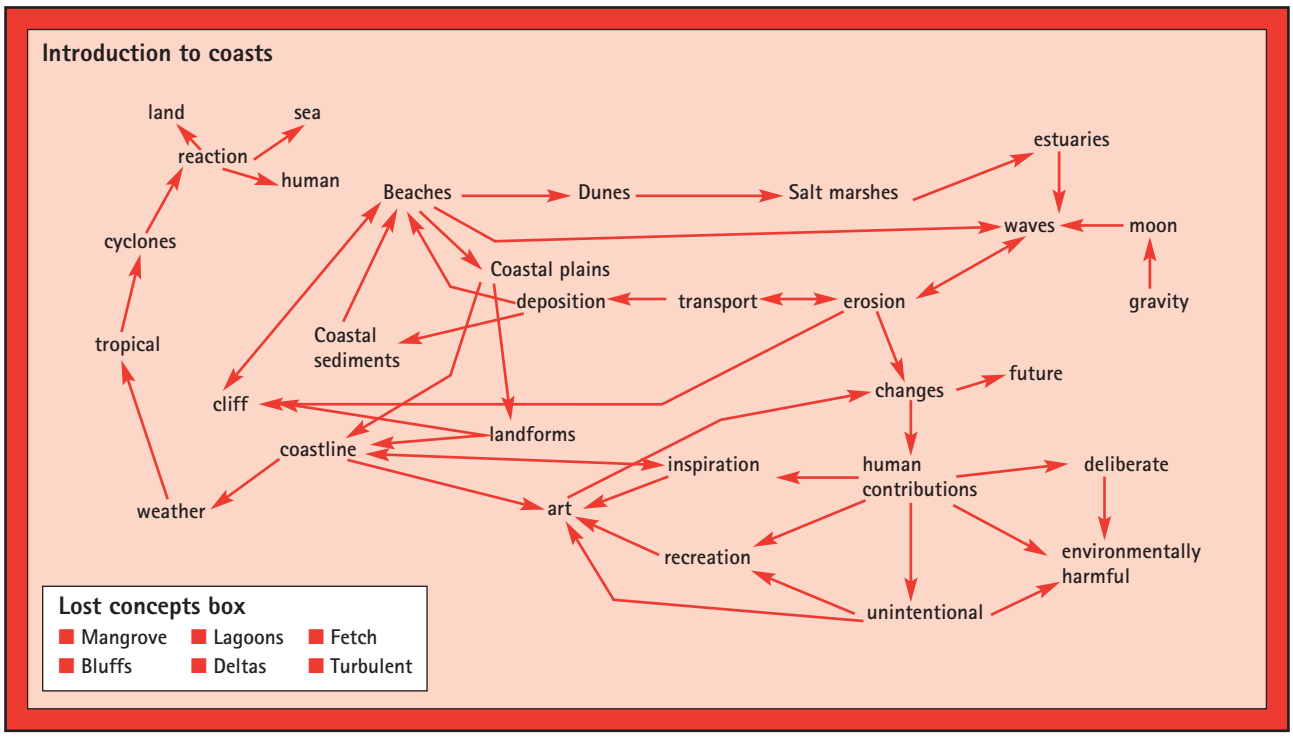

Figure 3: Mind map of coastal environments.

This approach allows students to get an early overview of the work they will be focusing on, and enables them to begin to make links between the constituent parts early in their learning. As a consequence, they are seeing their learning as being more organic and holistic, developing the areas they already have in front of them, rather than learning sequentially, whereby they may only have very vague notions of how the subject matter fits together.

It is also a great planning aid for the teacher. It gives a very clear idea of prior learning and those areas which are not generally understood by a group. It also allows any miscomprehensions to be detected very early on in learning. For example, in the example given in Figure 3, the student has indicated that waves are linked to the moon. This can be picked up, and this issue can then be highlighted when the appropriate learning on waves is encountered. It is then clear whether the student has better understanding once the subject matter has been covered. To check that the links made are not random or associated through proximity in the text, students were asked to write a one to two-side summary which gave a commentary on their mind map. This gave another extremely useful indicator of the extent of understanding, and also forced the students to develop their holistic consideration of the subject content.

The student who produced the mind map in Figure 3 included the following ideas in some written work:

'The whole of the coastal system is made up of different landforms, and different systems, and how they work together or against each other. Some of these landforms are things like cliffs, beaches, dunes, salt marshes and coastal plains.'

'The tide is caused by the moon and its gravitational pull on the earth.'

'Some of these changes are caused by human actions, such as burning fossil fuels, and abusing coastal areas with fires and dropping litter, and generally not treating the area with respect. This makes you think of what the future holds for these rare coastal landforms. These changes also affect the plants and animals that live and rely on these for their natural habitats'.

These statements could then be cross-referenced to the detail of the mind maps produced to gauge levels of understanding. For example, in the written account, it is obvious that the student realises that the moon causes tides rather than waves. As a consequence, it would be necessary to follow the detail of this up, whilst accepting that the student already has a level of understanding.

The quotes also demonstrate that, very early in this area of work, the student has an appreciation of the wider, complex nature of coasts. As such, the teaching and learning which follows this initial exercise can build both on prior learning and on this initial understanding of a holistic, complex system.

Conclusion

Many students parcel their learning into convenient 'bundles' of knowledge and understanding. However, this can often lead to an absence of a wider appreciation of the complexity and inter-connectivity of the subject. The use of mind maps and discussion can act as a simple way of opening up the debate about the essential nature of the subject as a whole and the links which need to be understood to give a wider and deeper appreciation of the subject. This can happen at a subject level, as with the example given here focusing on A2 students where they are evolving a wider understanding of the subject as a whole, or it can be used to encourage a more holistic approach to particular areas of the subject. In either case, what we are doing is helping students realise that the development of understanding is never a linear exercise – a simple accruing of facts – but a complex development of not only the facts but the links which weave them together. ■

References

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