

3.5.2 METHODS OF SEQUENCING WITHIN A COURSE

There are a number of ways in which you can sequence the units of a course (after Rowntree, 1990, and Romiszowski, 1986):

- **by topic** – This method can be used when the topics can be studied in any order.
- **chronologically** – An approach that might well apply to a history course but could even be used for a maths course when looking at how a topic has developed over time. An example of this can be found in Toeplitz (1963).
- **by place** – For example, you might work outwards from the home to the world or work from the micro scale (inside a cell) to the macro (the whole organism).
- **by cause and effect** – Here you might start with a phenomenon and explore its causes and origins.
- **by structural logic** – In this case you follow the logic of the subject. Maths is often taught like this.
- **problem-centred** – In this case you identify a problem and explore its solution (e.g., how do animals survive severe weather?).
- **spiral** – In the spiral approach, the same material is revisited several times at increasing depths.
- **backward chaining** – Here you start with the end result and gradually work backwards through the course to explore how that end result is achieved. For example, in building a spreadsheet, you could start with a finished spreadsheet and set some exercises on using and critiquing it. Through doing this, learners start with an overall understanding of a spreadsheet and then gradually develop a deeper understanding of how it is constructed.
- **a loose network** – In this case the material consists of a loose collection of topics that can be studied in any order. This is a typical approach in discovery learning and topic-learning. It is also an approach that is suited to hypermedia, whilst being difficult to implement in print.
- **a PERT network** – PERT networks are usually found in project management but they can be used to sequence the topics in a course. The idea of dependency is central to PERT networks. In project management, 'dependency' means that one task cannot be started until another has been completed. In course planning, 'dependency' means that one topic cannot be studied before another has been mastered. Using PERT networks is only practicable if you have access to some suitable project management software.

3.5.3 FACTORS THAT DETERMINE SEQUENCE AT THE UNIT OR TOPIC LEVEL

The first point to note is that there is no one correct way to sequence a particular chunk of learning. (There are, though, plenty of wrong ways to do it.) In deciding your sequence, you first need to identify what constraints there are on possible sequences. These constraints usually derive from the nature of the subject matter (Romiszowski, 1981). For example:

- If objective A can only be achieved after objective B has been learnt, then the teaching for A must come after the teaching for B.
- Where the objectives are closely related (e.g., steps in a process), then the teaching should follow that order.
- Where the parts of a process need to be learnt separately but eventually linked, then the learning sequence needs to take account of this. For example, to serve in tennis, the learner must learn to throw the ball up, then learn to hit it with the racket, and then learn to do both things as one sequence.

Other factors that affect sequencing are the ones described in the section below.

3.5.4 BASIC PRINCIPLES OF SEQUENCING AT THE UNIT OR TOPIC LEVEL

When introducing a new topic, it helps to follow one or more of four basic patterns:

- move from simple to complex,
- move from the known to the unknown,
- move from the particular to the general, or
- move from the concrete to the abstract.

The first pattern (simple to complex) is probably intuitively obvious. The other three methods are less obvious, but all derive from the fact that people learn something better when it is rooted in their own experience.

Table 11 shows four approaches to sequencing when introducing a new topic.

TABLE 11. Four ways of ordering when introducing a new topic

Principle	Example
Simple → complex	When teaching the present tense of verbs in a foreign language, teach the regular verbs before the irregular ones.
Known → unknown	When teaching about which types of plants prefer which types of soil, first ask learners to consider the plants that grow where the learners live and the type of soil there.
Particular → general	When teaching about the behaviour of acids, first consider some particular acids and then draw out the general principles of acids.
Concrete → abstract	When teaching about democracy as an abstract, theoretical concept, first consider some particular instance of democratic systems.

Source: Romiszowski (1981)