

## Teaching spaces for the 21<sup>st</sup> century

Stephen Bostock 11-10-07 (tidied in Feb 2009)

**Summary:** *The ‘classrooms’ we provide and their furniture partly determine the types of teaching/learning activities possible, and hence the students’ achievement of course intended learning outcomes. We have too many spaces designed for presentations that support an information gathering activity and simple learning outcomes such as recall and comprehension. We have too few spaces for medium and large classes that accommodate the small-group (3 to 6) discussion and similar activities that are needed for students to achieve the ‘higher’ learning outcomes of critical thinking planned in many courses. These spaces can be designed for multiple uses, although they inevitably need more space per student than packing sardines in rows.*

Undergraduate Higher Education has **learning outcomes** that include critical thinking and other intellectual skills, and changed perspectives, attitudes and values. For example, to take a small excerpt from the QAA level descriptor for third year-Honours undergraduate level: students should be have a conceptual understanding that enables the them “to devise and sustain arguments, and/or to solve problems, using ideas and techniques, some of which are at the forefront of a discipline; and to describe and comment upon particular aspects of current research, or equivalent advanced scholarship, in the discipline; ... [have] an appreciation of the uncertainty, ambiguity and limits of knowledge”

There is good evidence, as well as a traditional assumption by university teachers, that discussion in small groups is the best way to achieve these learning outcomes. Furthermore, it is not only in level 3 modules that small-group discussion is valuable. For retention in the first year, engagement with a programme and social inclusion are both supported by small-group discussions. What types of learning outcomes are we trying to achieve? There are different schemes to describe these, both simple and complex. Bligh’s<sup>1</sup> is very simple:

1. information recall,
2. critical thinking, and
3. attitudes and values.

1 is usually necessary to varying degrees but in weak students and poor courses can dominate the actual outcomes. 2 contains the ‘higher’ outcomes of higher education and should be important in the explicit outcomes of any university course. 3 has traditionally been under-represented but is increasingly being recognized as an element of graduate attributes and skills, and is implicit in some courses.

What types of **teaching/learning activities** are there in classrooms? Very many when considered in detail, but they can be simplified<sup>2</sup> to:

1. information transmission/reception (talk and chalk, dictating PowerPoint slides of bullet points, the traditional lecture)
2. multimedia information transmission/reception using images, audio, video
3. student individual activity
4. student-student interactivity (usually verbal discussion)
5. student-teacher interactivity (usually verbal discussion but also other feedback)

How do room size, layout and technology impinge on the types of teaching/learning activity possible and therefore the types of learning outcomes that can be achieved by *all students* in a group? (In any cohort the most able and committed students can survive poor teaching/learning activities and inappropriate rooms, but we must plan for every student succeeding.) In many respects, **group size** is crucial. In very small course cohorts (less than 10) teaching spaces are rarely a problem as students get individual attention. Unfortunately small cohorts are not economic and with large cohorts the difficulties of providing suitable spaces to support the small group activities necessary for all students to

achieve the learning outcomes are considerable. We will label these small group activities 'discussions' but they include a range of tutor-led and tutorless learning activities.

In discussions, as group size increases, the contribution of the least active students decreases, as does their learning. Groups of more than 4 typically show dominance by the teacher or some students, and passivity of other students. Groups of 3 to 6 are commonly needed. Clearly, 'tutorials' as we now have them are too large for this purpose.

How do teaching/learning activities affect the achievement of intended learning outcomes? And how do physical spaces affect this? The table below is a tentative map.

	Simple presentation	Multimedia presentation	S-S interaction	T-S interaction	S activity
1. Information recall	✓	✓✓			✓
2. Critical thinking			✓✓	✓✓	✓?
3. Attitudes		✓	✓✓	✓✓	

Presentations are only as effective at information transmission/gathering as any other medium, but are efficient for large groups (as efficient as photocopiers, books and WebCT). They also have a social function. Multimedia presentations are particularly memorable for some types of content, and video can also affect attitudes. **For critical thinking, presentations are of little use.** Conversely, although S-S and S-T interactions (e.g. in discussions) *can* be used for information transmission, they are too costly in time for that. Individual student activity can take place in almost any classroom.

How can rooms and their equipment help or hinder teaching and learning with medium/large groups?

1. Where presentations are being used for information transmission/recall, they should have equipment available (projectors, audio, video) to allow multimedia presentations. A clear view of multimedia is provided in tiered lecture theatres. This is why we are equipping our pool rooms with multimedia PCs and putting tiered seating in.
2. Teacher-student interaction is necessary for thinking (and often for correcting errors in transmission). With large groups, voting systems (communicubes or electronic handsets) support some types of interactions and can support more types of learning outcomes than information recall.
3. Where student-student interaction is needed, fixed benching prevents more than two or three students conversing. An ideal group size for contribution and learning by all members is between three and six depending on the activity. Therefore, rooms need to seat students in these groups or allow them to move to such groups.

(Note: we cannot assume that the S-S element, or discussion, needed in many courses for critical thought can be provided in 'tutorial' or 'seminar' sessions with single groups when these groups are 15 to 25 students - well over the maximum size for contributions and learning by *all* students. Tutorials were once a handful of students and fulfilled this need, but current staff student ratios often make small tutorials an uneconomic use of staff time. Small group discussions within a large group/room are more effective.)

There are two approaches, or a mix of them, to providing rooms for the variety of teaching/learning activities needed: (i) have rooms of different designs for presentations and for small-group discussions (ii) have rooms that can accommodate both. The latter is less risky as an investment. Of course, there is a cost to (ii): seating density is lower than for sardine-style rows of fixed tables or benches; it requires more space to enable small

group discussions, to have space to move chairs with writing arms or to have small tables for groups of 3 to 6. A cautious, flexible approach would be to a mix:

1. Some tiered lecture theatres with high density and good visibility for multimedia presentations (we have these – do we need more?)
2. Rooms designed for small group discussion, with movable seating with writing arms, or small mobile tables, at lower density. (We need to change the furniture in some of our medium-sized rooms.)
3. Rooms to accommodate both presentations and small discussion groups. Tables that are semicircular or half-hexagons would seat three when lined up in presentation mode, but allow buzz groups of three within lectures. Placed in pairs, the tables would accommodate groups of six in 'cabaret' style. A third arrangement of horse-shoes accommodates both activities.

**At the moment, too many rooms, large and small, are designed for presentations, in order to maximise packing density. We need more rooms for (many) small-group discussions (not small rooms) and more rooms for flexible uses.**

What of blended learning? Does this change anything? After all, WebCT has tools to support many types of learning activities. Can we do the spatially expensive activities online? In short, usually, no.

1. The simplest use of WebCT, for both staff and students, is information transmission, either as files made available or 'frequently asked questions' built up during the course with the WebCT 'discussion' tool. This replaces the need for most simple presentations – unless there is added value from a multimedia presentation or by T-S interactions (using voting) or S-S interactions in small buzz groups.
2. Online text 'discussions' are possible, but require new skills for both teacher and students. The literature shows that they are problematical in many circumstances. They can reinforce other face-to-face activities but will not replace verbal discussion in most undergraduate courses. They are best used to increase the educational value of other course elements, priming students before verbal discussion, debriefing after them, or continuing them. They are more valuable in their own right on part-time and professional courses.
3. Online self-tests are a form of S-T interaction, structured but private and flexibly available. They can add valuable feedback (T-S) for large cohorts but do not substitute S-S discussions or all types of interactions with students: higher education is fundamentally interpersonal.

The increasing use of WebCT, therefore, strengthens the conclusion above that we need no more, or fewer presentation spaces, and more discussion spaces.

---

<sup>1</sup> Bligh, D., *What's the point in discussion*, 2000, and *What's the use of lectures*, 5<sup>th</sup> edition, 1998, Exeter: intellect

<sup>2</sup> Bostock, S. J., Hulme, J. A. and Davys, M. A. 2006 *CommuniCubes: Intermediate Technology For Interaction With Student Groups*, pp 321-333 in *Audience Response Systems in Higher Education* edited by D. Banks, Hershey PA: Idea Group Inc.