

What is active learning? *Information Sheet*

Active learning works: the evidence – a paper for discussion

By Geoff Petty



“ Active learning? You must be joking, there’s no time for entertainment with all this content to cover.



We have all heard such views in staff rooms, yet in official circles active learning remains the orthodoxy. Professors queue up to insist upon it, inspectors require it and conference speakers chant its praises. Many of us also remember long lectures about its effectiveness during our teacher training. Yes, we all know the theory - but does it actually work in practice?

Many researchers have asked this question, and have tried a ‘let’s suck it and see’ approach to answer it. These are rigorous control group studies with real teachers in real schools and colleges.

Hundreds or even thousands of students are divided between an ‘*experimental group*’ which is taught with active methods and a ‘*control group*’ which is taught the same material without active methods.

The control and experimental groups are carefully composed to be identical in their mix of ability, social background and so on. The control and experimental groups are taught for the same length of time, by the same teachers or by teachers of the same ability, and the students are tested to see which group has learned best. In study after study of this type, active learning produced much better learning. (See the diagrams on page 3.)

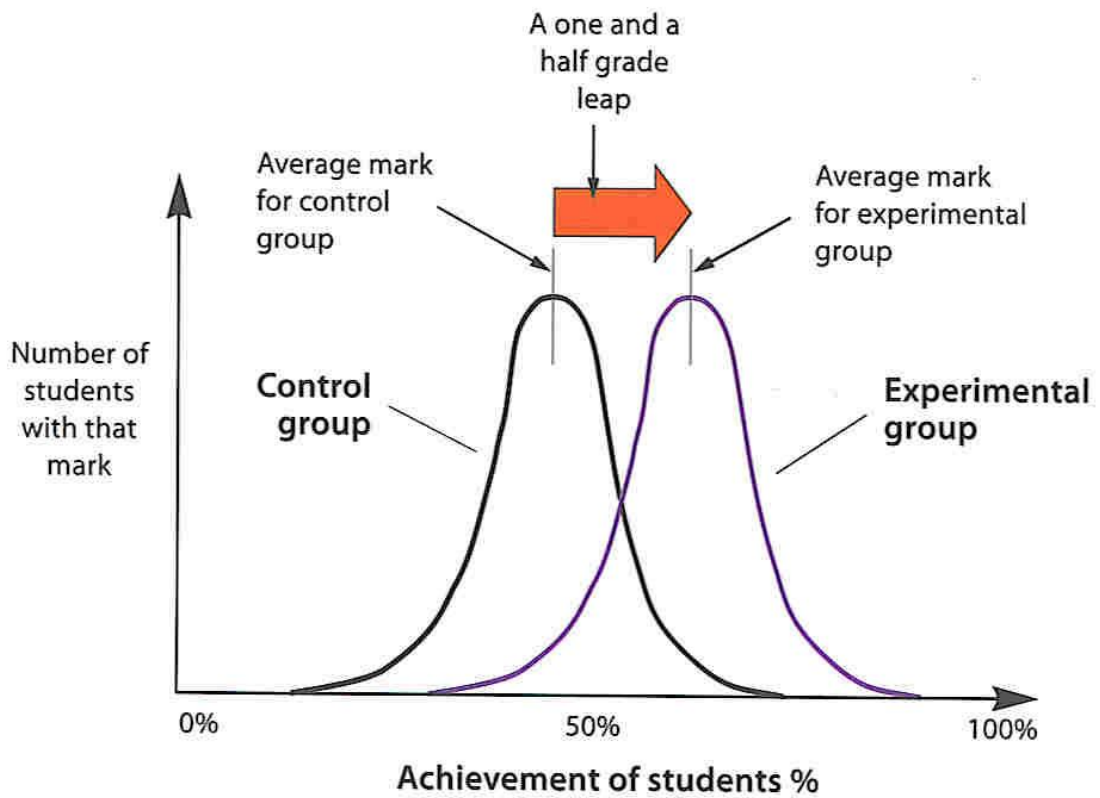
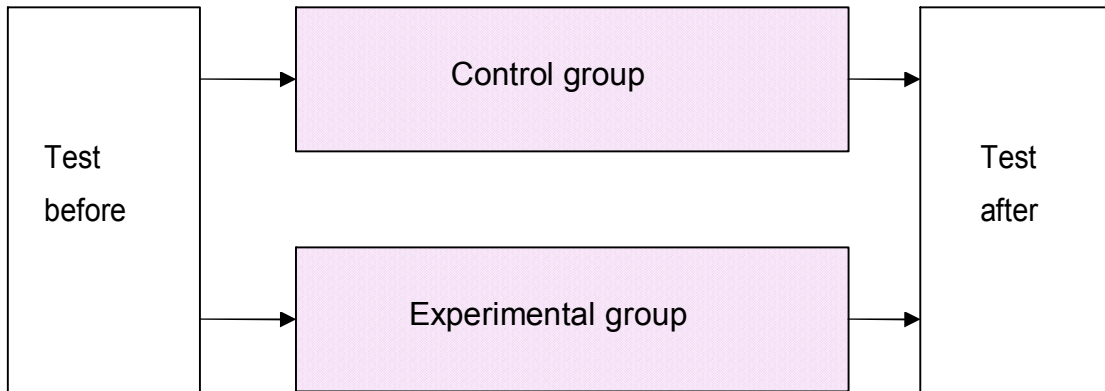
What is active learning?

In the studies summarised by Hattie, the term active learning means involving students in practising important skills and applying new knowledge. Lessons usually contained the elements listed below.

- **Reviews of previous learning.**
- **Showing how: the teacher showing how to do it, explaining this, and thinking out loud to show the process.**
- **Controlled practice where the class do work as a class, or as individuals, but the teacher checks closely and continually to decide whether students are ready for individual work. The meaning of the work is stressed as is the process (how they should do it) and the product (what they should create).**
- **Students doing work themselves individually: this is the heart of it.**
- **Students' work being checked: this includes the students checking their own and each other's work. This takes place during the lesson, and as soon as possible.**
- **Homework: assignments of about 15 minutes including some review questions.**
- **Structured reviews: reviews at the end of the lesson asking students 'What have we learned?' and agreeing and summarising this. Reviews at the beginning of every lesson to review the previous one. Reviews each week and each month to review previous topics.**

This version of active learning is called 'direct instruction' - a misleading name as it is so active! You can find out more about it on the active learning page of www.geoffpetty.com or in Mujis, D. & Reynolds D. (see references). It is only one way of organising active learning but it comes out very well in the research.

Never mind the theory - does it work in practice?



Active learning adds a grade and a half to achievement

Professor John Hattie has used careful statistical methods to average the findings of the 253 most rigorous studies on active learning. His findings show that a student in the experimental group will perform on average more than a grade and a half better than a student in the control group.

The time the teacher has to teach the topic is not a factor here. Remember that the groups taught with active learning methods were taught *for the same amount of time* as the control group. While the experimental group was engaged in the active learning methods, the control group was receiving more content and fuller explanations from their teacher. But the control group learned *less*.

Many teachers say active learning would be great 'if they had the time'. But the research shows that if you *make* the time for effective active learning by doing less didactic teaching, your students will do better. It may seem strange not to be able to say everything you know about the topic you are teaching, but it will not help if you do. You know too much!

Active learning works best at every academic level. Graham Gibbs, in a large study, identified the university courses that produced the highest quality learning (deep learning) and the highest achievement. Researchers then visited these courses to discover how they were taught. The courses were found to use active learning, on tasks that the students found interesting, with plenty of student interaction. The teaching was also well structured so that new learning was built on old.

Peter Westwood, summarising research on how best to teach students with learning difficulties argued for highly structured, intensive, well directed, *active* learning methods.

So active learning *does* work - but why? One way of answering this question is to look at what is going on in students' brains when they are learning. This also helps us to understand how best to use active learning.

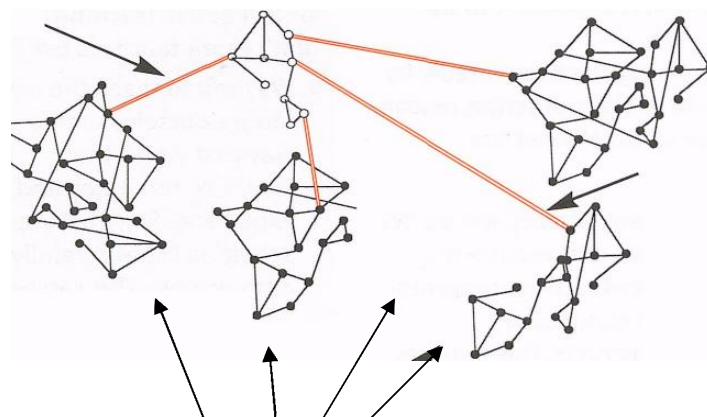
Constructivism

New learning

Links that create understanding

This new concept

- **Is similar to**
...
- **Is related to**
...
because ...



Existing concepts, knowledge and experience

Learning is a 'meaning-making' process

What happens in the brain of students when you ask them a question that requires them to recall something you have successfully taught them? They go to a part of their brain where the information is stored, encoded in a 'construct' which is a network of interconnected brain cells (neurons). The learner then decodes this construct to answer your question. Everything we know is in the form of these constructs, all of which we have made ourselves.

However, new learning is not *understood* unless it is connected to existing concepts, knowledge and experience. For example, a student may be able to repeat parrot-fashion a textbook definition of a scientific concept without understanding what it means. It is the long red links between concepts and experiences that 'explain' this new concept, rather like a dictionary definition explains one concept in terms of another.

These explaining links can only be created by the learner. The links are made stronger if they:

- **involve recent vivid experience, e.g. active, engrossing, multi-sensory experience that is important to the learner;**
- **are used often, e.g. used repeatedly by the learner to explain, describe, reason and to make sense of what has happened.**

Note that not just any activity will do. We need to set activities that require the learner to make constructs of important concepts and then connections between these constructs. This requires the learner to reason as well as to have direct experience. (Many students do not bother to make constructs when they are just listening because of this lack of reasoning.)

But relevant activity is not enough. We also need to get our students to *think* about this experience so they really do learn from it. We need to get them to explain it to themselves, to each other and to you. This reflection is the active meaning-making process in action; it prompts the students to form concepts, to improve them and to create those long red explaining links that make the subject 'make sense'.

These resources will help you create vivid, thought-provoking, sense-making experiences for your students. Try them more than once and try them in different ways, adapting them until they work even for your weaker students. Then why not try devising some more active methods of your own for other topics?

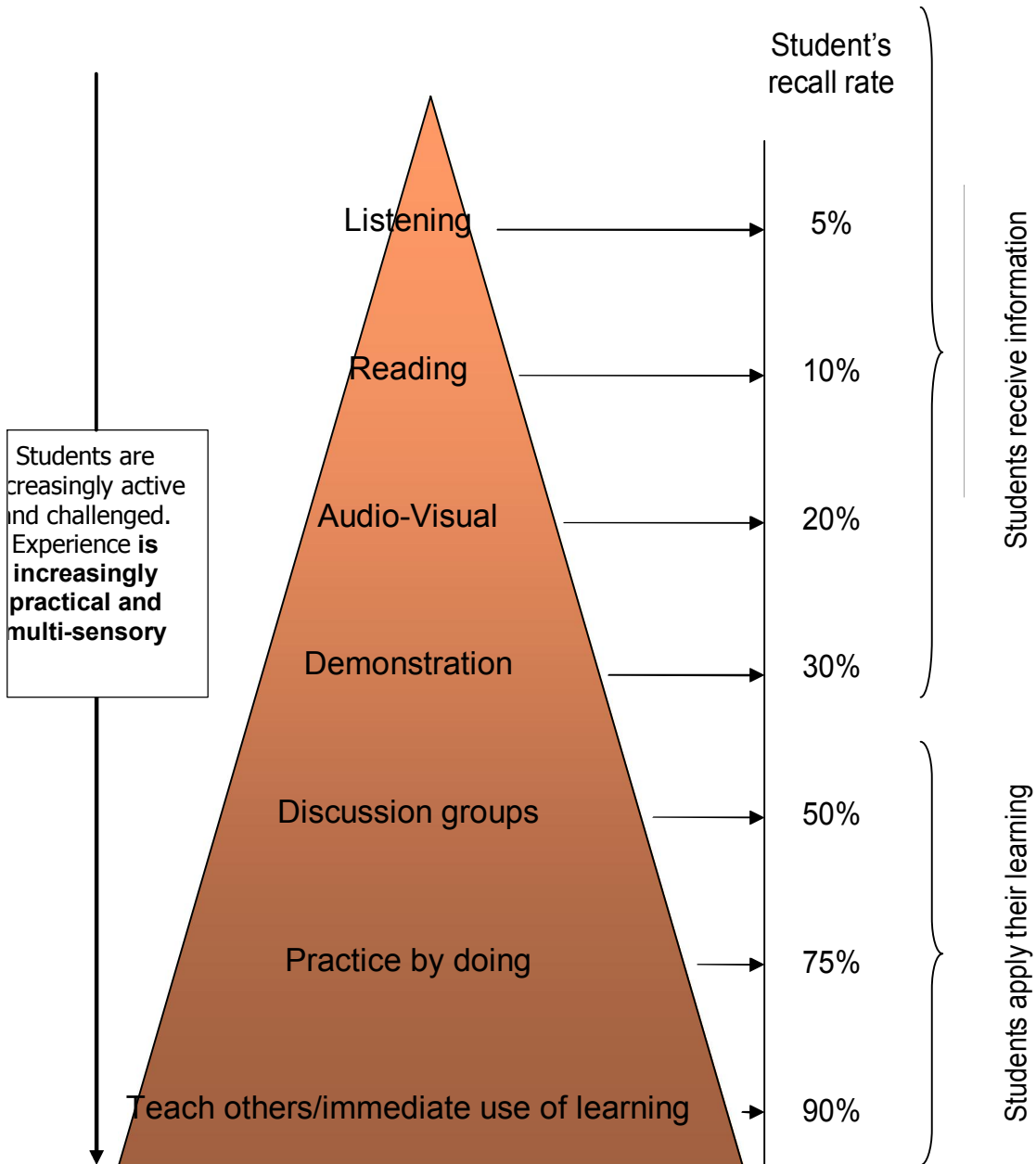
Let's not confuse the delivery of content with its arrival - or good explaining with good learning. In the end, it is perhaps no surprise that students only become good at doing it by doing it!

Well, if active learning works, why don't more teachers use it?

- **We tend to teach the way we were taught ourselves, rather than in the way that works best.**
- **We know too much and enjoy explaining. So when you set activities, listen carefully to learners as they work. This can be even more enjoyable and less hard work than explaining and the feedback is very informative.**

The learning pyramid

The recall rate of different teaching strategies. The National Training Laboratories (USA).



References

- Mujis, D. and Reynolds, D., *Effective teaching: evidence and practice*, 2001, London, Paul Chapman Publishing.
- Gibbs, G., *Improving the quality of student learning*, 1992, Bristol, Technical and Educational Services Ltd.
- Hattie, J.A., *Influences on student learning*. This can be downloaded from Professor John Hattie's staff home page: <http://www.arts.auckland.ac.nz/staff/index.cfm?P=5049>
- Petty, G. *Teaching today: a practical guide* 3rd edition, 2004, Cheltenham, Nelson Thornes. See also www.geoffpetty.com
- Westwood, P., *Commonsense methods for children with Special Educational Needs*. 4th edition, 2003, London, Routledge Falmer.