

Active learning

We use 'active learning' to describe a classroom approach which acknowledges that learners are active in the learning process by building knowledge and understanding in response to learning opportunities provided by their teacher. This contrasts with a model of instruction whereby knowledge is imparted or transmitted from the teacher to students. For Cambridge, active learning means that learners take increasing responsibility for their learning, and that teachers are enablers and activators of learning, rather than lecturers or deliverers of ideas.

What other terms are associated with active learning?

Other approaches and terminology that are associated with active learning include:

- **student-centred, or learner-centred learning**, where students play an active role in their learning, with the teacher as an activator of learning, rather than an instructor
- **enquiry-based, problem-based or discovery learning**, where learners learn by addressing and posing scientific questions, analysing evidence, connecting such evidence to pre-existing theoretical knowledge, drawing conclusions, and reflecting upon their findings
- **experiential learning**, which broadly describes someone learning from direct experience.

Many authors define these terms slightly differently, and such categorisations of learning have some overlap with each other.

What is the theory behind active learning?

- Active learning is based on a theory of learning called **constructivism**, which emphasises the fact that learners *construct* or *build* their own understanding. Learning is a process of making meaning. Learners replace or adapt their existing knowledge and understanding (based on their prior knowledge) with deeper and more skilled levels of understanding. Skilled teaching is therefore active, providing learning environments, opportunities, interactions, tasks and instruction that foster deep learning.
- The theory of **social constructivism** says that learning happens primarily through social interaction with others, such as a teacher or a learner's peers. One prominent social constructivist, Lev Vygotsky (1896–1934), described the **zone of proximal development (ZPD)**. This is the area where learning activities should be focused, lying between what the learner can achieve independently and what the learner can achieve with the teacher's expert guidance. By **scaffolding** tasks, providing guidance and support that challenges the learner based on their current ability, and through providing rich feedback using **assessment for learning** (see separate Education Brief), the teacher actively helps students develop deeper levels of understanding.
- Active learning is also consistent with other theories of learning:
 - Learning should be **relevant** and situated within a **meaningful context**. This idea was developed by the philosopher Jean-Jacques Rousseau (1712–1778) and influenced numerous educators in the early 20th century such as John Dewey (1859–1952) and Maria Montessori (1870–1952). It led to inquiry-based and discovery learning models. The main idea here is that we learn best when we can see the usefulness of what we learn and connect it to the real world.
 - Learning is **developmental**. Learning experiences for children, therefore, should be **age-appropriate**, although development level and age are not always concurrent.





What are the benefits of active learning?

- Active learning fosters **understanding** (rather than rote learning facts), which students can then apply to diverse contexts and problems. It is this understanding and problem solving approach that employers and universities seek.
- Active learning fosters students' learning and their **autonomy**, giving them greater involvement and control over their learning and giving them skills to foster life-long learning in the future. It is closely associated with **learning how to learn**.
- Learners will be better able to revise for examinations in the sense that revision really is 're-vision' of the ideas that they already understand.

What are the challenges/criticisms of active learning?

Some practices are contentious and need to be distinguished from active learning, for example:

- **Learning styles** have been adopted by some schools as an approach to make their classrooms more

learner-centric. There are a number of different models of learning style, for example, visual, auditory or kinaesthetic. However, such models are in fact more likely to refer to information processing styles, with little consistent research evidence linking them to learning.

- Some teachers perceive active learning as a form of progressive education, expecting the learner to learn by themselves or in groups with **the teacher acting solely as a facilitator**. As Professor Elizabeth Rata (2012) argues, "A teacher who says 'I co-inquire with my students', 'I learn from them', 'We construct knowledge together' does not deserve that status." Active learning requires highly skilled teaching that uses a wide range of instruction that incorporates scaffolding of tasks, a deep appreciation of how assessment can be used in support of learning, and recognition of the need for differentiation as learners are at different levels.
- Following on from the point above, John Hattie believes evidence shows that active, guided instruction is much more effective than unguided, facilitative instruction. Hattie looked at learner progress and developed a metric called 'effect size' (d) to determine the extent of the impact of different factors. He devised a barometer on which 0 equals 'no progress' and an effect size of 1 is equal to 'advancing children's achievement by 2 to 3 years' (Hattie, 2009:7). A typical effect size over 1 year is 0.4; this acts as a 'hinge point' and so more focus should be on those factors which research shows to have an effect size above 0.4. In his meta-analyses, Hattie (2009:243) distinguishes between the teacher as **activator** and the teacher as **facilitator**. In the 'activist' mode, teachers are key agents in all the interventions on the left hand side of the table below, and more 'facilitative' in the interventions on the right hand side. The effect size is far greater when the teacher acts as an activator rather than a facilitator (0.60 compared to 0.17).

Teacher as activator	d	Teacher as facilitator	d
Reciprocal teaching ¹	0.74	Simulations and gaming	0.32
Feedback	0.72	Inquiry-based teaching	0.31
Teaching students self-verbalization	0.67	Smaller class sizes	0.21
Meta-cognition strategies	0.67	Individualized instruction	0.20
Direct instruction	0.59	Problem-based learning	0.15
Mastery learning	0.57	Different teaching for boys and girls	0.12
Goals – challenging	0.56	Web-based learning	0.09
Frequent/effects of testing	0.46	Whole language – reading	0.06
Behavioural organizers	0.41	Inductive teaching	0.06
Average indicator	0.60	Average indicator	0.17

¹ More details on the precise nature of these interventions can be found in John Hattie's *Visible Learning* (2009).

- Different cultures also have different traditions in the way classrooms and schools are run, with some cultures focused very much on the importance of the teacher. In such classrooms, and in classrooms with relatively limited resources, it is tempting to think that active learning cannot take place. However, group work and careful, learner-focused questioning and instruction can still secure a classroom within which active learning happens. Carefully planned direct instruction, involving whole-class interactions rather than the teacher just lecturing students, can be one effective teaching methodology associated with active learning.
- Learner-centred teachers will set their teaching in real-world contexts, and they will find out learners' starting points of understanding before they plan how to enable them to learn. Because of this, a learner-centred teacher will focus on differentiation, and will use strategies associated with **assessment for learning**, including:
 - effective questioning
 - sharing of assessment criteria
 - provision of feedback
 - peer assessment and self-assessment
 - using assessment information to adapt their teaching.

Practical tips

How can schools make the best use of active learning?

Evidence indicates that excessive focus on examination results encourages teaching to the test, and reduces the extent to which active, student-centred learning is adopted (Polesel, Dulfer & Turnbull, 2012). Developing a school ethos which focuses on student learning, rather than simply attainment, is essential in enabling teachers to avoid an 'exam factory' mentality and to foster learners' greater enjoyment and ownership of their own learning. This requires strong leadership and the confidence that a focus on learning will yield good examination results in itself without examinations having to 'drive' teachers' practice.

How can teachers make the best use of active learning?

- Given that learners construct knowledge through the medium of language, a learner-centred teacher should enable learners to **build knowledge through talking, reading and writing**. The use of dialogue, discussion and group work is important in fostering whole-class understanding.

How can learners make the best use of active learning?

Learners must realise that understanding is more important than memorising. There is more chance of success in building long-term understanding rather than just learning facts. They should approach lessons in this way, realising that they have to actively 'make sense' of ideas rather than just remember facts, and that success depends on their willingness to make mistakes, to engage in discussion, to realise and accept they are sometimes wrong, and to learn from each other.

Why is active learning relevant to Cambridge?

Cambridge assessments do not simply test recall of knowledge but ask learners to draw on their understanding in order to analyse, evaluate and synthesise ideas. In this way, Cambridge programmes and qualifications are best taught using active learning approaches which are also more engaging for students. Encouraging active learning enables learners to attain higher grades, based on their enhanced understanding, and better prepares them for further education and the workplace.





How is Cambridge supporting schools with active learning?

- Active learning underpins the **professional development qualifications** offered by Cambridge and in particular the Cambridge International Certificate in Teaching and Learning, and the Cambridge International Diploma in Teaching and Learning.
- Our **curriculum support materials and training** also encourage an active learning approach.
- Our recently published guide, *Implementing the Curriculum with Cambridge*, aimed at school principals, school leaders and others responsible for the educational programme in a school, outlines an active learning approach.

Where can you find more information?

- Hattie, J. (2009) *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. Abingdon, UK: Routledge.
- *Implementing the Curriculum with Cambridge: A Guide for School Leaders*
www.cie.org.uk/images/134557-implementing-the-curriculum-with-cambridge.pdf
- O'Neill, G. and McMahon, T. (2005) 'Student-centred learning: what does it mean for students and lecturers?' In O'Neill, G., Moore, S. and McMullin, B. (Eds.) *Emerging Issues in the Practice of University Learning and Teaching*. Dublin, Ireland: All Ireland Society for Higher Education.
www.aishe.org/readings/2005-1/oneill-mcmahon-Tues_19th_Oct_SCL.html
- Petty, G www.geoffpetty.com/for-teachers/active-learning
- Polesel, J., Dulfer, N. and Turnbull, M. (2012) *The Experience of Education: The Impacts of High-Stakes Testing on School Students and Their Families*. Australia: University of Western Sydney.
www.whitlam.org/_data/assets/pdf_file/0008/276191/High_Stakes_Testing_Literature_Review.pdf
- Rata, E. (2012) *The Politics of Knowledge in Education*. Abingdon, UK: Routledge.
- *Student-Centred Learning: Toolkit for Students, Staff and Higher Education Institutions* (2010). The European Students' Union. www.esu-online.org/resources/6068/Student-Centred-Learning-Toolkit
- Information on Cambridge professional development qualifications can be found on our website at: www.cie.org.uk/pdq

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