

## Reading guide to *Literature Review in Thinking Skills, Technology and Learning*

[www.futurelab.org.uk/research/reviews/ts01.htm](http://www.futurelab.org.uk/research/reviews/ts01.htm)

This reading guide provides an overview of each section within Futurelab's *Literature Review in Thinking Skills, Technology and Learning*.

### Section 1 – Terms and context (pp.3 – 7)

Key questions discussed include:

- How are thinking, skills, learning and technology related?
- Can thinking skills be taught?
- What is the role of technology in teaching thinking skills?
- How can we design technology to support teaching thinking skills?

*Workers in [the] new economic climate require transferable thinking skills rather than content knowledge or task-specific skills. They particularly require an ability to learn how to learn new things since accelerating technological change is making old skills (and knowledge) redundant and generating needs for new skills (and knowledge). p.7*

### Section 2 – Can we teach thinking skills? (pp. 7 – 11)

Key questions discussed include:

- Can we or should we teach thinking skills?
- Do general thinking skills exist?
- Are thinking skills individual or social?
- Are critical thinking skills white, male and middle class?
- Should thinking skills be taught separately from content areas?
- What can brain studies tell us?
- Is there evidence for the value of teaching thinking skills?

*The consensus, supported by research evidence, is that the best way to teach thinking skills is not as a separate subject but through 'infusing' thinking skills into the teaching of content areas. p.11*

### Section 3 – Teaching thinking skills with technology (pp. 11 – 18)

Key topics covered include:

- conceptualisations of the role of ICT in education
- uses of computer as a tutor
- uses of mind tools
- computer as a support for learning conversations
- how to teach thinking with ICT.

*Effective teaching for transferable thinking skills with ICT contains some or all of the following elements:*

- *teaching a 'thinking' vocabulary and giving learners an explicit explanation of the thinking skills that they are to be learnt*

- *observing an expert performing the task (modelling)*
  - *giving timely feedback on performance (formative assessment)*
- direct support in the early stages of learning a task (scaffolding) and then a gradual move towards self-regulation and autonomy (teacher fade-out)*
- *the opportunity to articulate thinking strategies and discuss these with other learners (thinking together)*
  - *the explicit demonstration of how thinking strategies acquired in one subject area can be used to solve problems in another area (bridging).*
- p.18

#### **Section 4: Implications for practice, curriculum development and the design of learning resources (pp. 18-19)**

Key topics discussed include:

- implications for practice
- implications for curriculum development
- implications for the design of learning resources.

*The use of technology alone does not lead to transferable thinking skills. The success of any educational activity crucially depends on how it is framed. Learners need to know what the thinking skills are that they are learning and these need to be explicitly modelled, drawn out and re-applied in different contexts.*

*...effective collaborative learning needs to be prepared. It helps if learners are explicitly taught how to reason and learn together before they are asked to work collaboratively with ICT.*

*learners can construct their own understandings together but in a way that is directed towards curriculum goals by the computer software*

p.18