TEACHING THINKING SKILLS – SELECTED RESOURCES 2003

This selection of resources has been compiled by the NUT with assistance from Miranda Bell (Centre for the Use of Research and Evidence in Education, CUREE); Steve Higgins and Viv Baumfield (Centre of Thinking Skills at the University of Newcastle); and Patrick Costello (North East Wales Institute of Higher Education, Wrexham).

It draws together:

1.   Introduction to Thinking Skills resources
2.   Books and reports about teaching thinking and thinking skills
3.   Academic articles about teaching thinking and thinking skills
4.   Published programmes and classroom resources
5.   Subject specific resources
      Geography
      History
      ICT
      Maths
      RE/PHSE
      Science
6.   Books, articles and resources about research processes and tools
7.   More general books and articles about teaching, thinking and learning
8.   Magazines and websites

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1.   Introduction to Thinking Skills resources

Carol McGuinness's Research Brief for the DfES (McGuinness, 1999) gives a good general overview of some of the more well-known programmes in teaching Thinking Skills. She recognises three different kinds of approach, including those that:

> target thinking skills as a discrete entity;
> explore thinking skills in a subject specific approach;
> aim to infuse thinking skills in a generic way across all lessons.

The six key programmes that McGuinness mentions are:

Feuerstein's Instrumental Enrichment (IE) (Feuerstein et al, 1980)

The best-known thinking skills programme, developed over 40 years ago. It has been widely used and extensively evaluated, showing positive effects mainly on non-verbal reasoning.

Somerset Thinking Skills Course (Blagg, 1988 and 1989)

This is a UK version of the IE approach, developed when a study (Blagg, 1991) showed no positive outcomes of IE applied in a UK context. Shows positive effects on a range of cognitive outcomes.

Matthew Lipman's Philosophy for Children (Lipman et al, 1980)

Closely linked with Robert Fisher's work on primary schools (Fisher, 1998), this is a widely used approach in the UK and is especially suited to application in the context of social and moral education. Evaluations have shown positive outcomes in many areas, including quality of students' discussion and argumentative skills, ability to formulate questions and self-esteem.

CASE (Cognitive Acceleration through Science Education)

A highly successful programme aimed at 11-14 years, shown to be effective at raising GCSE grades for students (Adey and Shayer, 1994). Two subsequent projects have emerged: CAME (Cognitive Acceleration through Mathematics Education) and the Nuffield Primary Science Project which helps primary age students understand topics such as electricity, light, sound and energy.

Thinking Through Geography (Leat, 1998)

A curriculum development project aimed at geography teaching at the post-primary level. Evaluation work is ongoing.

ACTS (Activating Children's Thinking Skills) project. (McGuinness et al, 1997)

The UK adaptation of a US programme on the infusion approach to developing thinking skills (Swartz and Parks, 1994). The project is aimed at upper primary level, specifically Key Stage 2 and has been evaluated in the Northern Ireland curriculum.

The specific references identified above are provided in more detail later in the document.

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2.   *Books and reports about teaching thinking and thinking skills*

Adey, P. & Shayer, M. (1994) **Really raising standards: cognitive intervention and academic achievement.** London: Routledge. This article has also featured on the GTC's Research of the Month website (http://www.gtce.org.uk/research/romhome.asp) called "**Improving learning through cognitive intervention**".

Baron, J.B. & Sternberg, R.J. (Eds.) (1987) **Teaching Thinking Skills, theory and practise.** New York: Freeman.

Blagg, N. (1991) **Can we teach intelligence?: a comprehensive evaluation of Feuerstein's Instrumental Enrichment.** Hillsdale, N.J.: Lawrence Erlbaum Associates.

Blagg, N. & Ballinger, M. (1989) **The Somerset Thinking Skills.** *In* Coles, M.J. & Robinson *Teaching Thinking*. Bristol: Press Bristol.

Coles, M.J. & Robinson (1989) **Teaching thinking.** Bristol: Bristol Press.

Collins, C. and Mangieri, J.N. (1992) **Teaching Thinking: An Agenda for the Twenty-First Century** Hillsdale, NJ: Lawrence Erlbaum.

Costello, P. (2000) **Thinking Skills in Early Childhood Education***. David Fulton Publishers ISBN: 1853465518

DeBono, E. (1992) **Teach your child to think.** London: Penguin.

Fisher, R. (1998) **Teaching thinking: philosophical enquiry in the classroom.** London: Cassell. ISBN 0-30470-06-5

Lipman, M. (1988) **Philosophy goes to school.** Philadelphia: Temple University Press.

Lipman, M., Sharp, A. & Oscanyan, F. (1980) **Philosophy in the classroom.** (2nd Ed.) Philadelphia: Temple University Press.

McGuinness, C. et al (1997) **Final report on the ACTS project: phase 2.** Belfast: Northern Ireland Council for Curriculum, Examinations and Assessment.

McGuinness, C. (1999) **From Thinking Skills to thinking classrooms: a review and evaluation of approaches for developing pupils' thinking.** London: DfEE, (Research Report RR115).   Download a Word version of this report: (http://www.dfes.gov.uk/research/data/uploadfiles/RB115.doc)

Murris, K. & Haynes, J. (2000) **Storywise: thinking through picture books.** Somerset: Dialogue Works.

Novak, J.D. (1998) **Learning, creating and using knowledge.** New Jersey: Lawrence Erlbaum.

Novak, J.D. & Gowin, D.B. (1994) **Learning how to learn.** New York: Cambridge University Press.

Quinn, V. **Critical Thinking in Young Minds** London: David Fulton.

Resnick, L.B. & Klopfer, L.E. (Eds.) (1989) **Toward the thinking curriculum: current cognitive research.** Alexandria, VA: Association for Supervision and Curriculum Development.

Sharron, H. & Coulter, M. (1987) **Changing children's minds: Feuerstein's revolution in the teaching of intelligence.** London: Souvenir Press.

Sharron, H. & Coulter, M. (1994) **Changing Children's Minds** Birmingham: Imaginative Minds.
Splitter, L.J. and Sharp, A.M. (1995) **Teaching for Better Thinking – The Classroom Community of Inquiry** (Melbourne, ACER).

Swartz, R. & Parks, S. (1994) **Infusing the teaching of critical and creative thinking into content instruction: a lesson design handbook for the elementary grades.** Pacific Grove, Calif.: Critical Thinking Press & Software.

A copy of '**Better Cognition**' – the report of a conference 'A Whole Lot of Thinking Going On', held at NUT Headquarters during November 2001- can be obtained from Janet Friedlander, NUT Information Officer (e-mail: j.friedlander@nut.org.uk)

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3. Academic articles about teaching thinking and thinking skills

Adey, P. & Shayer, M. (1993) **An Exploration of Long-Term Far-Transfer Effects Following an Extended Intervention Program in the High School Science Curriculum.** *Cognition & Instruction*, 11(1), pp.1-29.

Adey, P., Robertson, A. & Venville, G. (2002) **Effects of a cognitive acceleration programme on Year I pupils.** *British Journal of Educational Psychology*, 72, pp.1-25.

Baumfield, V.M. & Higgins, S. (1997) **"But no one has maths at a party": pupils' reasoning strategies in a Thinking Skills programme.** *Curriculum,* 18(3), pp.140-148.

Baumfield, V.M. & Oberski, I.O. (1998) **What do teachers think about Thinking Skills?** *Quality Assurance in Education*, 6(1), pp.44-51.

Baumfield, V.M. (2000) **Inquiry made public: Thinking Skills and professional development**. *Education Review*, Vol. 14(1), pp.76-79. ISSN 1462 7272.

Burden, R. & Nichols, L. (2000) **Evaluating the process of introducing a thinking skills programme into the secondary school curriculum**. *Research Papers in Education*, 15(3), pp. 293-306.

Costello, P.J.M. (1993) **Developing philosophical thinking in schools**. *Aspects of Education*, 49, pp. 49-65.

Costello, P.J.M. (1995) **Education, Citizenship and Critical Thinking.** *Early Child Development & Care*, 107, pp.105-114.

Costello, P.J.M. (1996) **Values and the teaching of philosophical thinking**. *Curriculum*, 17(3), pp.132-143.

Higgins, S. and Baumfield, V. (1998) **A Defence of Teaching General Thinking Skills**. *Journal of Philosophy of Education,* 32(3), pp. 391-398. ISSN 0309 8249

Lake, M. (2000) **Improving concentration and memory skills.** *Teaching Thinking,* 1, p.16-30.

Leat, D. (1999) **'Rolling the stone uphill: teaching development and the implementation of Thinking Skills programme'.** *Oxford Review of Education*, 25(3), pp.387-403.

Leat, D. and Higgins S. (2002) **The role of powerful pedagogical strategies in curriculum development.** *The Curriculum Journal* 13(1), pp. 71-85. (ISSN 0958-5176)

Leat, D. and Nichols A. (2000) **Brains on the Table: diagnostic and formative assessment through observation.** *Assessment in Education* 7(1), pp.103-121.

Lipman, M. (1998) **Teaching Students to Think Reasonably: Some Findings of the Philosophy for Children Program**. *Clearing House*, 71(5), pp. 277-280.

McGuinness, C. & Nisbet, J. (1991) **Teaching thinking in Europe**. *British Journal of Educational Psychology,* 61(2), pp.174-186.

McGuinness, C. (1993) **Teaching thinking: new signs for theories of cognition.** *Educational Psychology*, 13(3&4), pp.395-416.

McGuinness, C., Wylie, J., Greer, B. & Sheehy, N.A.F. (1995) **Developing children's thinking: A tale of three projects**. *Irish Journal of Psychology*, 16(4), pp. 378-388.

Mercer, N., Wegerif, R. and Dawes, L. (1999) **'Children's talk and the development of reasoning in the classroom'.** *British Educational Research Journal*, 25(1), pp.95-111.

Pithers, R.T. & Soden, R. (2000) **Critical Thinking in Education: A Review**. *Educational Research*, 42(3), pp. 237-249.

Romney, D.M. and Samuels, M. T. (2001) **A meta-analytic evaluation of Feuerstein's Instrumental Enrichment program.** *Education and Child Psychology,* 18(4), pp.19-34.

Shayer, M. (1999) **Cognitive acceleration through science education II: its effects and scope**. *International Journal of Science Education*, 21(8), pp. 883-902.

Wegerif, R. (1996) **Using computers to help coach exploratory talk across the curriculum**. *Computers & Education*, 26(1-3), pp. 51-60.

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4.   *Published programmes and classroom resources*

Blagg, N., Ballinger, M. & Gardner, R. (1988) **Somerset Thinking Skills course handbook.** Oxford: Basil Blackwell.

Dawes, L. Mercer, N. and Wegerif, R. (2000) **Thinking Together: A Programme of activities for developing thinking skills at KS2** Birmingham: Questions Publishing (also see their website http://www.thinkingtogether.org.uk).

Feuerstein, R. et al (1980) **Instrumental Enrichment: an intervention for cognitive modifiability.** Baltimore, Md: University Park Press.

Fisher, R. (1996) **Stories for thinking.** Oxford: Nash Pollock. ISBN 1-89825-50-9

Higgins, S. (2001) **Thinking Through Primary Teaching** Cambridge: Chris Kington Publishing ISBN 1 899857 39 7.

Lake, M. & Needham, M. (1996) **Top ten thinking tactics: a practical introduction to the Thinking Skills revolution.** Birmingham: Questions Publishing Company.

Murris, K. and Haynes, J. (2001) **Storywise: Thinking Through Stories** Dialogue Works: Newport ISBN 1-903804-00-0.

Rocket, M and Percival, S. (2002) **Thinking for Learning** Stafford: Network Education Press

Smith, A. (1998) **Accelerated Learning in Practice** Stafford: Network Educational Press

Smith, A., Call, C. and Batton, J. (1999) **The ALPS approach: Accelerated Learning in Primary Schools** (revised edition) Stafford: Network Educational Press Ltd. ISBN 1-855390-56-6.

Sunderland LEA (2001). **Learning for Thinking : Thinking for Learning Resource Pack**. Sunderland LEA

Wallace, B. and Adams, H.B. (1993) **TASC: Thinking Actively in a Social Context** Oxford: AB Academic Publishers.

Wallace, B. (2001) **Teaching Thinking Skills Across the Primary Curriculum** London: David Fulton/NACE. ISBN 1 85346 766 9.

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5. *Subject specific resources*

Geography

Higgins, S. (2002) **Learning to Learn.** *Primary Geographer,* 47, pp.22-23 (ISSN 0956 277X)

Leat, D. (1998) **Thinking through geography.** Cambridge: Chris Kington Publishing. ISBN 1-899857-42-7

Nichols A. and Kinninment D. (2000) **More Thinking Through Geography** Cambridge: Chris Kington Publishing

History

Byrom, J. (1998) **'Working with sources: scepticism or cynicism? Putting the story back together again'** *Teaching History*, 91, May, p.32-33.

Counsell, C. (1997) **Analytical and discursive writing in history at Key Stage 3.** London: Historical Association.

Fisher, P. (1999) **Analysing Anne Frank: a case study in the teaching of Thinking Skills.** *Teaching History*, 95, pp.24-31, Historical Association.

Fisher, P. (Ed.) (2002) **Thinking through history.** Cambridge: Chris Kingston Publishing. ISBN 1-899857-44-3

ICT

Crooks, C.K. (1994) **Computers and the collaborative experience of learning.** London: Routledge.

CTGV (Cognition and Technology Group at Vanderbilt) (1996) **Looking at technology in context: a framework for understanding technology and education research.** *In* Berliner D.C. 7 Calfee, R.C. (Eds.) *Handbook of Educational Psychology*. New York: Macmillan; London: Prentice Hall Int. p.807-840.

Higgins, S. and Packard, N. (2000) **Zoombini Power**. *Teaching Thinking,* 1, pp.12-14 Birmingham: Questions Publishing Company

Wegerif, R. & Scrimshaw, P. (Eds.) (1997) **Computers and talk in the primary classroom.** Clevedon: Multilingual Matters.

Maths

Coles, A. (2000) **Developing a need for algebra.** London: Teacher Training Agency. (Research Grant Scheme Summary). http://www.canteach.gov.uk/community/research/grant/summaries98_99.htm

Higgins, S. (2000) **Figure Out the Framework**. *Teaching Thinking,* 2, pp.41-43 Birmingham: Questions Publishing Company

RE/PHSE

 Baumfield, V (Ed)(2002) **Thinking Through RE**. Cambridge: Chris Kington Publishing.

Midgley, P. et al (2000) **Promoting Students' Spiritual, Moral, Social and Cultural development through specific teaching and learning strategies across the curriculum.** London: Teacher Training Agency. (Research Grant Scheme Summary).

Science

Adey, P.S., Shayer, M. and Yates, C. (1995) **Thinking Science: The Curriculum Materials of the CASE Project.** London: Thomas Nelson and Sons.

Agar, J. et al (2000) **Teaching children to generate questions designed to improve their capacity to think critically about scientific problems.** London: Routledge.

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6. *Books, articles and resources about research processes and tools*

Burden, R.L. (1999) **Children's self perceptions: child psychology portfolio.** Windsor: NFER/Nelson.

Edwards, A.D. and Westgate, D.P.G. (1994) (2nd Edition) **Investigating Classroom Talk**. London: The Falmer Press.

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7.   *More general books and articles about teaching, thinking and learning*

Black, P. & Wiliam, D. (1998) **Inside the black box: raising standards through classroom assessment.** London: King's College.

Bonnett, M. (1994) **Children's thinking.** London: Cassell.

Gardner, H. (1993) **Multiple intelligences: the theory in practice.** New York: Basic Books.

Hamers, J.H.M., van Luit, J.E.H. and Csapo, B. (eds) (1999) **Teaching and Learning Thinking Skills** Abingdon: Swets and Zeitlinger.

Kozulin, A. (1990) **Vygotsky's Psychology: a biography of ideas.** London: Harvester Wheatsheaf.

Mercer, N. (2000) **Words and minds: how we use language to think together.** London: Routledge.

Newton, D. (2000) **Teaching for Understanding** London: Routledge/Falmer ISBN 0-415227-91-7.

Novak, J.D. & Gowin, D.B. (1994) **Learning how to learn.** New York: Cambridge University Press.

Portelli, J.P. and Reed, R.F. (1995) **Children, Philosophy and Democracy** Calgary: Detselig Enterprises Ltd. ISBN 1 55059 115 0

Sharp, P. (1999) **Promoting emotional literacy.** Southampton: Southampton City Council.

White, R. and Gunstone, R. (1992) **Probing Understanding** London: Falmer Press.

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8.   *Magazines and websites*

Edward de Bono's catalogue of resources (such as CoRT and the Thinking Hats) is on-line (http://www.edwdebono.co.uk/debono/home.htm) and colour-coded like his six thinking hats.

Thinking Together (http://www.thinkingtogether.org.uk) have a site offering free software, articles for downloading and details of recent publications.

Alistair Smith's Accelerated Learning has its own website (http://www.alite.co.uk/) as does Robert Fisher (http://www.teachingthinking.net/)

Kings College London's two thinking skills programmes CASE (Cognitive Acceleration Through Science Education) and CAME (Cognitive Acceleration Through Maths Education) and Let's Think for Key Stage 1 pupils. Information about CASE can be found at: http://www.kcl.ac.uk/depsta/education/teaching/CASE.html. And CAME similarly at: http://www.kcl.ac.uk/depsta/education/teaching/CAME.html

Dialogue Works (http://www.dialogueworks.co.uk/) produce Newswise, an on-line resource to promote thinking through news stories, and Storywise, a handbook by Karen Murris and Joanna Haynes for developing Community of Enquiry with young children.

SAPERE (Society for the Advancement of Philosophical Enquiry and Reflection in Education) is a UK based educational charity offering resources, conferences, and training in philosophy for children. Membership forms from Sara Liptai, 7 Cloister Way, Leamington Spa CV32 6QE. SAPERE website: http://www.sapere.net

IAPC (Institute for the Advancement of Philosophy for Children) (http://chss.montclair.edu/iapc/homepage.html) produces 'Thinking'. The Institute for Critical Thinking (http://www.chss.montclair.edu/ict/homepage.html) produces 'Inquiry'. Both are at Montclair State University, Upper Montclair, New Jersey, 07043, USA.

ICPIC (the International Council for Philosophical Inquiry with Children) distributes 'Thinking, Analytic Teaching and Critical and Creative Thinking'. Subscriptions from ACER, Private bag 55, Camberwell, Victoria 3124, Australia. Reports and papers from their annual conference are available on the SAPERE website (see above)

Teaching Thinking is a quarterly magazine from Questions Publishing Company, Birmingham http://www.teachthinking.com and has regular articles about developing thinking in the classroom.

The DfES Standards site 'Schemes of Work' section (http://www.standards.dfes.gov.uk/schemes) has a section on thinking skills related to different areas of the curriculum. Go to the 'Teachers' Guide' link under the specific subject area, and then 'Links with Other Areas of the Curriculum'.

The GTC has a Research of the Month (RoM) website (http://www.gtce.org.uk/research/romhome.asp) which aims to bring research to practitioners in an accessible format by summarising studies and articles of direct interest to teachers. Relevant RoMs to date are **Improving learning through cognitive intervention** based on the study by Adey and Shayer (1994).

The Scottish Council for Research in Education (SCRE) Spotlights series (http://www.scre.ac.uk/spotlight/index.html) are short papers on general education issues. Relevant papers are:

- Spotlight 26: John Nisbet (1990), **Teaching Thinking: an introduction to the research literature**

- Spotlight 79: Valerie Wilson (2000), **Can thinking skills be taught**

- Spotlight 82: Keith Topping (2001), **Peer and Parent Assisted Learning in Reading, Writing, Spelling and Thinking Skills**

Teaching Thinking Skills, (http://www.nwrel.org/scpd/sirs/6/cu11.html) by Kathleen Cotton, is another entry in School Improvement Research Series at Northwestern University with information on a number of approaches.