

Review of Reviews

A report for the Steering Committee

1 Background

1.1 This report is not a technical document intended for publication. It is a report to the Steering Committee of the Teaching and Learning Programme. The purpose of the report is to provide the Committee with an appraisal of where the gaps are in the field of research on teaching and learning as these relate to the aims of the Programme and might be revealed in the processes of reviewing.

1.2 Before reporting on the corpus of reviews it is necessary to say something about reviews and the reviewing process in educational research. This is because the nature, aims, objectives and methods of reviewing are contested issues in the field. For those interested in the details, the debates are most explicitly conducted both in theoretical and practical terms in the pages of the most widely cited review journal, Review of Educational Research (RER) published by the American Educational Research Association.

1.3 At the heart of the debate lie fundamental differences in views about the nature of education. To put the issue starkly, there are those who take the view that education is, 'a deliberate human enterprise that aims to empower individuals to increase their social mobility, obtain a better job and so on' (Schwandt, RER, 1998 p.410). In this perspective educational research is conducted to identify 'what works' with a view to improving the educational enterprise.

Educational research progresses by understanding educational processes through scientific studies which build a picture of the field piece by piece. The review examines all the single studies of an issue and, by means of induction, synthesises the individual findings into a general conclusion. A good review will resolve inconsistencies and settle an argument. Is, for example, small group working better than whole class teaching in promoting student achievement and motivation?

1.4 This technological view of education and educational research is challenged by those who hold the view that

education does not consist of a set of controlled variables. Rather, it is a, 'kind of morally informed and morally committed action guided by ethical criteria immanent within the practice itself' (Schwandt, 1998, p.411). Here, education is a form of human and humanising enterprise. It requires 'wise and prudent judgement' appropriate to the particular situations in which it is played out. Educational enquiry is not a separate process from educational activity per se. Knowledge of educational phenomenon cannot be reduced to the objective verification of regularities aspired to in the scientific model. Education is about self understanding which is an endless process. From this perspective a review of studies does not 'settle arguments' it makes for argumentation. It seeks inconsistencies rather than patterns. It does not afford solutions to received problems. Rather it makes the familiar strange, generates new perspectives and offers new challenges to thinking and to practice (see Eisenhart, 1998, Meachan, 1998, Murray and Raths, 1994 for further discussions of these aspects of reviewing and their relationship to education and educational enquiry).

1.5 These disparate views of education lie (albeit mostly unacknowledged) at the heart of debates about the quality of educational enquiry. Each view generates specific criteria for excellence in the conduct of both education and of educational enquiry.

1.6 In regard to the technical view of educational enquiry, the criteria are generally made explicit by journal editors (see, for example, Murray and Raths, 1994). These usually demand high standards of technical excellence both in the reviews per se and in the literature to be reviewed. In regard to the interpretive view of education, reviews are called for which challenge the thinking of the reader and which, 'put us in the way of education and invite our participation' (Schwandt, 1998 p.412). Clearly, this perspective cannot be easily associated with the relatively objective criteria of the technical approach. Criteria for judging interpretive reviews seem to have more in common with literary criticism than with scientific forms of judgement.

1.7 In the next section of this report I focus on technical reviews aspiring to identify 'what works' in relation to

pedagogy.

2 From a technical perspective on education, a good example of a review is offered by Lou, Abrami, Spence, Poulsen, Chambers and Apollonia (1996). These reviewers compared the effects of whole class teaching versus within class groupings on pupil achievement in American elementary, secondary and post-secondary grades.

2.1The authors cite exactly which databases for which time periods were searched and nominate the search terms or key words used. They describe the branching out techniques into citations literature. They note that over 3000 publications were revealed to be about within class groupings for teaching.

2.2The criteria for selection for review attention are then laid out. In this case these include:

- i. The research must have occurred in an authentic and relevant academic setting (ie to discount laboratory studies, and counselling groups),
- ii. the grouping condition had to be sustained rather than short term,
- iii. there had to be measured outcomes from both the 'treatment' (grouping) and 'control' (whole class) conditions,
- iv. the research had to be with students in the normal range of attainment (ie excluding SEN and very able students).

2.3The criteria were applied to each study independently by the professional researchers as judges. 66 studies met the inclusion criteria and are fully detailed in the review, including a summary of the data on achievement in each instance.

2.4Worthy studies (ie those which met the criteria cited) were then analysed by statistical techniques to identify the size of differences in learning outcomes between whole-class and grouped-class conditions and further analysed in the search for patterns revealing factors associated with differential achievement. The techniques for these

analyses are themselves subject to analysis, debate and refinement (see, for example, Lix et al (1996) and Dunkin (1996)).

2.5For the record the analysis showed that there are small but positive effects of placing pupils in groups in terms of student achievement and attitudes to learning. These positive effects were maximised when the grouping was associated with between group modifications to teaching methods and materials and when the groupings were in large classes. The effects were bigger in maths and science than in other subjects and bigger for middle ability students than for high ability students.

2.6The patterns of findings open up the possibility of theorising the results and of generating testable hypotheses and hence advancing our understanding of classroom processes. They also open up the possibilities of teachers tailoring their within class grouping decisions to fit the particularities of their classes, subjects taught and other variables used in the review.

2.7The key point to note here however is that the methods and criteria of reviewing in this technical sense are made explicit. The review process can be checked. Conclusions are based on 'best evidence'. Studies which cannot provide measurable effects across controlled conditions are excluded. Exclusion criteria almost always reduce the scope of the review to relatively small numbers of studies but the studies that meet the criteria are considered to afford 'safe knowledge'. Technical reviews can never be better than the studies they draw on.

2.8From Lou et al, it does not follow that 'grouping' is better than 'whole class teaching'. It does follow that some pupils in some subjects taught by the teachers in the reviewed studies did profit from this arrangement. It does not follow that teachers who have not used grouping techniques will meet with similar successes if they were to operate grouping methods. The review does not reveal in terms of practical action what would bring about the pedagogic success associated with group teaching.

2.9There are very few reviews of educational research which meet or even approximate the strict criteria used by Lou et al. Such reviews do however mark out a field and open up

the potential for further work to fill in the knowledge gaps.

3 Interpretive reviews constitute the bulk of review work in education. Of course, in a sense, all reviews are interpretive. In the trade however, the term generally refers to a review exercise or essay which uses evidence selectively from a field to argue a case. There is, in this work, no necessary commitment to 'best evidence'. Rather the commitment is to tell a story or to generate prescriptions from theory using evidence from empirical studies as illustration. No claim is made to normal science methods.

On the contrary, an ostentatiously narrative style is adopted and appeals to the procedures for establishing validity relevant to narrative are overt (or more often, implicit).

3.1 An outstanding example of a narrative or interpretive review is offered by Bruner (1996). In common with many interpretive reviews the work is book length. Bruner draws on a vast literature to identify challenges facing modern educational systems, develops a conceptual framework for analysing them, and suggests (on the basis of selected evidence) ways of advancing pedagogy and the research base for teaching and learning.

3.2 Interpretive reviews cannot be evaluated by the criteria set for technical reviews. They are best judged not on whether, on the basis of evidence they settle a question but on the basis of whether they vitalise workers in the field.

4 Many if not most reviews in education fall uncomfortably across the above categories. They contain reference to 'what works' evidence but in selective ways. The evidence cited does not necessarily come from well designed and executed studies. The modes of selection are generally not described. Nor is there a rigorous treatment of the magnitudes of measured effects of pedagogic treatments. Most reviews, in this way, become part of the rhetoric of education rather than components of a safe evidence base. However, they can, and often do, identify potential research agendas in the field.

5 Review of reviews. This review of reviews was conducted to identify gaps in the field of pedagogic research with a view to helping the Steering Committee make decisions on

funding. In compiling the attached list of reviews the following processes were used:

- a. All American, Australian and UK databases on education psychology, sociology and anthropology were searched using key terms; review, teaching, learning, achievement, for the period 1990 onwards. This produced almost nothing.
- b. The same databases were searched using the above key terms but omitting 'review'. Tens of thousands of items were cited. That is to say, individual studies of teaching and learning were identified.
- c. Consultation and discussions were held with experts in teaching and learning in various fields and subjects. They were asked to nominate recent evidence based reviews in their field. Discussions built up a network of consultations. This generated a corpus of reviews. The reviews cited in the attached **Review** section had something to say either about pedagogy or, more often, about a research agenda to advance the understanding and practice of pedagogy.

5.1 The list is organised under review headings for convenience. I imposed these headings on the material to hand. Items which are marked with a 'T' (technical) conform, in my judgement, to the highest technical standards in the field.

There is very little work that meets this standard. Even where a field has been heavily researched it is rare to find a substantial database on which to make policy and practice decisions. This position is well captured by Askew and Wiliam (1995) who comment on research on mathematics education, 'it has been a sobering experience to realise how little British research there is on important issues in teaching and learning' (p. 1). Synonymous expressions characterise the field.

5.2 I have marked 'M' (mixed) the cases where a review draws on an evident database selectively. Whilst these reviews rarely have direct evidence based implications for policy or pedagogy, they do offer suggestions for further research.

5.3 I have marked 'I' (interpretive) reviews which are largely

theory based or do not claim to call on a evidence base reliably linking teaching to learning. The materials cited do make suggestions for pedagogy and, implicitly, for pedagogic research. They also offer insights into the state of the art of research in the field.

5.4I have classified the reviews as T, M or I to give you my view of the field. I am not claiming any fundamental validity for this.

5.5I would suggest the following conclusions:

- a. There is encouraging evidence (from a Programme point of view) that proximal factors under the influence of educators (eg students' intellectual activity, classroom instruction and management) exert more influence on learning than distal factors (eg educational policies, organisational structures) (Wang et al, 1993).

This should support and encourage a Programme focus on pedagogy and in particular on directing attention to processes implicated in learning (such as motivation and constructive, cognitive activity).

- b. There are strong evidence bases which are well theorised in regard to a wide range of psychological processes relevant to learning (see the review section on 'theory and general').
- c. There is a strongly theorised body of knowledge relating learning processes, if not achievement, to various factors in provision in HE (see the HE section).
- d. In most curriculum areas and fields there are very few evidence based studies linking teaching to learning (see the sections on art, early years, environmental education, media, life long learning, non-academic outcomes, religious education, teacher education).
- e. There is everything to play for in most fields. Where there is an evidence base in a subject or field (numeracy, literacy, science) it is unreliable and contested.
- f. No field need be excluded on the basis of this review.

References

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Reviews

Art

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Cunliffe, L. (1999) Learning how to learn, Art Education and the 'Background' Journal of Art and

Design Education, vol 18, no 1, pp 115 - 121 (I)

Cupchik, G. C., and László, J. (1992) (ed)
Emerging visions of the aesthetic process (New
York; Cambridge University Press) (M)

Assessment **Black, P., and Wiliam, D. (1998) Assessment and classroom learning. Assessment in education: principles, policy and practice, 5, 1, 7-75 (T)**

Gipps, C.V. (forthcoming) Sociocultural aspects of assessment. Review of research in education (I)

Torrance, H., and Pryor, J. (1998) Investigating formative assessment (Buckingham: Open University Press) (M)

Early Years **Fraser, H., (1998) Early intervention : key issues from research (Edinburgh : SOEID) (www.hmis.scotoft.gov.uk/riu) (M)**

Fraser, H. (1997) Early intervention: a literature review (for Ofsted on
www.hmi.scotoff.gov.uk./rim) (M)

Sharp, C. (1998) Age of starting school and the early years curriculum (paper presented to the NFER Annual Conference, 6 October 1998) (M)

Sharp, C., and Benfield, P. (1995) Research into season of birth and school achievement: a selected annotated bibliography (Slough: NFER) (M)

Class Size **Ofsted (1995) Class size and the quality of education (Ofsted; London) (T)**

Environmental Education **Tomlins, B., and Evans, A. (1994) Environmental education research centres directory (Slough: NFER) (I)**

Ethnicity **Gillborn, D., and Gipps, C. (1996) Recent**

research on the achievement of ethnic minority pupils (London: Institute of Education for Ofsted) (M)

Green, P. (ed)(1999) Pathways to intercultural education and raising achievement (European Commission DGXXII) (M)

Powney, J. (1998) Education of minority ethnic groups in Scotland (SCRE) for the Scottish Office (M)

Expertise Ericsson, K.A., and Charness, N. (1994) Expert performance : its structure and acquisition. American Psychologist, 49, 8, 725 - 747. (M)

Gender Arnot, M., Gray, J., James, M., Ruddock, J. (1998) Recent research on gender and educational performance (London: HM Stationery Office for Ofsted) (M)

Howe, C. (1997) Gender in classroom interaction (Edinburgh: SCRE) (M)

Kenway, J., and Gough, A. (1998) Gender and science education in schools: a review with attitude, Studies in Science Education, 31, 1-30 (I)

Powney J. (1996)Gender and attainment (SCRE) for the Scottish Office (M)

Ten Dam, G., Van Eck, E., and Volman, M. (1997) Research programmes on gender and education : results and conceptualisations. European Journal of Education, 32, 4, 411 - 425. (I)

Grouping Harlem, W., and Malcolm, H. (1997) Setting and streaming: a research review (Edinburgh: SCRE) (T)

Sukhnandan, L., and Lee, B. (1998) Streaming, setting and grouping by ability : a review of

the literature (Slough: NFER) (M)

Lou, Y., Abrami, P.C., Spence, J.C., Poulsen, C., Chambers, B., and D'Appolonia, S. (1996) Within class grouping : a meta analysis. Review of Educational Research, 66, 4, 423 - 458. (T)

Higher
Education

Dart, B., and Boulton-Lewis, G. (1998) Teaching and Learning in higher education (Melbourne : ACER) (M)

Drummond, I., Nixon, I., and Wiltshire, J. (undated) Personal transferable skills in higher education : the problems of implementing good practice (personal communication) (I)

Entwistle, N.J. (1994) Teaching and the quality of learning: what can research and development offer to policy and practice in higher education (Research seminar series for the CVCP and SHRE) (I)

Entwistle, N.J. (1992) The impact of teaching on learning: a literature review (USDU for the Employment Department, Training, Enterprise and Education Directorate). (M)

Entwistle, N. (1998) Conceptions of learning, understanding and teaching in higher education. In B. Dart and G. Boulton-Lewis op cit.

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HEFCE/DENI (1998) Evaluation of the fund for the development of teaching and learning (HEFCE) (I)

Law, P.M. (1996) Undergraduate science education: a review of research. Studies in

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Richardson, J.T.E. (1999) Approaches to studying in distance education. Higher Education 37, 23-55 (M)

Scienler (ed) (1998) Research perspectives on open distance learning (Bologna : for the European Commission)(Commission - DG XII) (I)

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Weimer, M. and Lenze, L. F. (1997) Instructional Interventions : A Review of the Literature on Efforts to Improve Instruction (p 205 - 240). In Perry, R. P. and Smart J.C (ed) op

cit (T)

Homework

Hallam, S., and Cowan, R (in press) Is homework important for increasing educational attainment? (Personal communication) (T)

Sharp, C. (1997) Bibliography of research studies on homework : 1988 - 1997 (Slough; NFER) (M)

ICT

Assent Project Consortium (1999) Telematics for education and training sectors : working towards knowledge society telematics applications (for the European Commission Project SU 2101) (I)

Carter, D.S.G. (1997) New generation instructional information technology and the management of teaching and learning (paper presented to Annual Conference BERA) (I)

Dillon, A., and Gabbard, R. (1998) Hypermedia as an educational technology: a review of the quantitative research literature on learner comprehension, control and style. Review of Educational Research, 68, 3, 322-349 (T)

Kozma, R.B. (1991) Learning with media. Review of Educational Research, 61, 2, 179-211 (M)

Laurillard, D. (1993) Rethinking University teaching: a framework for the effective use of educational technology (I)

Laurillard, D., et al (1994) Teaching and Learning with interactive media (Coventry : NCET) (M)

Laurillard, D., and Taylor, J. (1994) Designing the Stepping Stones : An evaluation of

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Watson, D. N. (ed) The impact report : an evaluation of the impact of information technologies on children's achievements in primary and secondary schools (Kings College London) (M)

Wood, D. (1998) The UK ILS Evaluations : Final Report (Coventry : Becta) (T)

**Libraries
and
Media**

Atkins, M.J. (1998) Themes of learning and multi-media applications. *Research Papers in Education*, 8, 2, 251-271 (I)

Libraries of the future (1996) (Coventry: NCET) (M) Sargant, N. E. (1996) Broadcasting and the Adult Learner : A review of current research and research needs. Paper prepared for the IZI International Conference (Munich) (I)

**Life
Long
Learning**

Edwards, R., Raggatt, P., Harrison, R, MacCollum, A., and Calder, J. (1998) Recent thinking in lifelong learning : a review of the literature (DfEE, Sudbury) (I)

Field, J., and Schuller, T. (1999) Investigating the learning society. *Studies in the education of adults*, 31, 1 (page proofs by personal communication). (I)

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Literacy

Beard, R. (1998) National Literacy Strategy : review of research and other related evidence (London : DFEE) (I)

Brooks, G., Flanagan, N., Henkhuzens, Z., and Hutchison, D. (1998) What works for slow readers: the effectiveness of early intervention schemes (Slough: NFER) (M)

Dombey, H. (1998) Early literacy teaching and learning : Innovative practice in four different national contexts, a thematic network (Brussels, The European Commission) (Final report of project ERB-SOE2-CT95-2002) (I)

Harrison, C. (1995) Methods of teaching reading : key issues in research and implications for practice (www.hmis.scotoff.gov.uk) (M)

Medwell, J., Wray, D., Poulson, L., and Fox, R. (1998) Effective teachers of literacy (Exeter, University of Exeter) (M)

Perfetti, C.A., Rieben, L., and Fayol, M. (eds) (1997) Learning to spell : research, theory and practice across languages (London : Lawrence Erlbann Associates) (M)

Maths

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**Bishop, A. J., Clements, K., Keital, C.,
Kilpatrick, J., and Laborde, C. (eds) (1996)**
International Handbook of Mathematics
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and Millett, A. (1998) Is the National Numeracy**
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learning (New York : Macmillan) (M)

**Motivation
and
volition**

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volition in learning and performance. Review
of Research in Education, 19, 301 - 341 (M)

Crowder, M., and Pupyain, K. (1993) The
motivation to train (London: The Employment
Department) Research Series No. 9 (I)

**Non-academic
outcomes**

Good, L., T (1999) (Ed). The purposes of
Schooling in America, Elementary School
Journal, 99, 5, 383 - 389 (I)

**Organisational
Learning**

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Addison-Wesley) (I)

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Perspectives and Policy Implications, Journal
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Tabberer, R. (1994) School and Teacher effectiveness (Slough : NFER) (I)

Religious education

Jackson, R. (in press) Reflections on research in religious education. Aspects of Education (personal communication) (I)

Science

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Psychology, 43, 583-626 (M)

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Human abilities. Annual Review of
Psychology, 49, 479-502 (M)**

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perspectives on teaching and learning. Annual
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**Wang, M.C., Haertel, G. D., and Walberg, H. J.
(1993) Toward a knowledge base for school
learning. Review of Educational Research, 63,
3, 249 - 294. (T)**

Thinking

**Blagg, N., Lewis, R., and Ballinger, M. (1994)
Thinking and learning at work: a report on the
development and evaluation of the thinking
skills at work modules (Employment
department research series no. 23) (M)**

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for transfer across domains. American
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